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(Fw)

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)	
	:	Examiner: B. O. Dulaney
TOMOAKI ENDOH)	
	:	Group Art Unit: 2625
Application No.: 09/964,787)	
	:	Confirmation No.: 3430
Filed: September 28, 2001)	
	:	
For: PERIPHERAL EQUIPMENT AND)	October 3, 2005
MANAGEMENT METHOD	:	
THEREOF)	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUBMISSION OF SWORN ENGLISH TRANSLATION

Sir:

Applicant respectfully submits herewith a sworn English translation of the priority document for the subject application, i.e., Japanese Patent Application No. 2000-302029 filed on October 2, 2000.

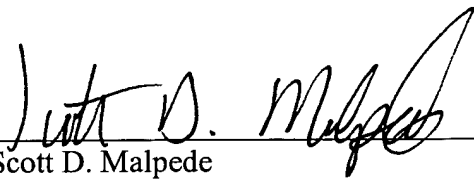
Accordingly, pursuant to 35 U.S.C. §119 it is respectfully requested that U.S. Patent No. 6,859,832 (Gecht), filed October 16, 2000, be removed as a reference.

For the reasons set forth in the Amendment filed September 5, 2006, the claims presented for consideration, i.e., Claims 5, 9, 24, 28, 39 and 41, are submitted to be patentable over the proposed combination of Nishizawa '228 in view of Gecht, et al. '832.

Appln. No.: 09/964,787

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,



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D E C L A R A T I O N

I, TAKAO OCHI, a Japanese Patent Attorney registered No.10149, of Okabe International Patent Office at No. 602, Fuji Bldg., 2-3, Marunouchi 3-chome, Chiyoda-ku, Tokyo, Japan, hereby declare that I have a thorough knowledge of Japanese and English languages, and that the attached pages contain a correct translation into English of the priority documents of Japanese Patent Application No.2000-302029 filed on October 2, 2000 in the name of CANON KABUSHIKI KAISHA.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made, are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such wilful false statements may jeopardize the validity of the application or any patent issuing thereon.

Signed this 29th day of September, 2006

TAKAO OCHI

PATENT OFFICE
JAPANESE GOVERNMENT

This is to certify that the annexed is a true copy of the following
application as filed with this office.

Date of Application: October 2, 2000

Application Number: Japanese Patent Application
No. 2000-302029

Applicants: CANON KABUSHIKI KAISHA

Commissioner,
Patent Office
(Seal)

October 26, 2001

KOZO OIKAWA

Certificate No.2001-3094579

2000-302029

[Name of the document]	Patent Application
[Reference No.]	4260030
[Date]	October 2, 2000
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[Number of the Claims]	78
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[List of Filed Materials]

[Material] Specification 01

[Material] Drawings 01

[Material] Abstract 01

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[Proof Requirement] Required

2000-302029

[Name of the Invention]	Specification
[Title of the Invention]	Peripheral Equipment, Information Processing Apparatus, Peripheral Equipment Control System, Management Method, Management Software, And Storage Medium

[What Is Claimed Is]

[Claim 1]

Peripheral equipment managed by a directory server connected through a network, for managing a job sent from an external device in accordance with a job management command received, comprising:

first decrypting means for decrypting an access ticket included in said job;

second decrypting means for decrypting an access ticket included in the job management command; and

managing means for managing said job in accordance with the decrypted contents of the access ticket included in said job and the access ticket included in said job management command.

[Claim 2]

Peripheral equipment managed by a directory server connected through a network, for managing a job sent from an external device in accordance with a job

management command received, comprising:

first decrypting means for decrypting an access ticket included in said job;

second decrypting means for decrypting an access ticket included in the job management command;

storing means for storing said decrypted access ticket included in the job management command;

issuing means for issuing a session key for said stored access ticket;

obtaining means for obtaining said stored access ticket in accordance with said session key included in said job management command; and

managing means for managing said job in accordance with the decrypted contents of the access ticket included in said job and said obtained access ticket.

[Claim 3]

The peripheral equipment according to claim 1 or 2, further comprising:

comparing means for comparing user ID information in the access ticket included in said job with user ID information in the access ticket included in said job management command; and

instructed operation executing means for performing an operation instructed by said job management command when the user ID information is identical in both access tickets.

[Claim 4]

The peripheral equipment according to claim 3, wherein said job management command is a command for canceling the instructed job.

[Claim 5]

The peripheral equipment according to claim 1 or 2, comprising:

comparing means for comparing user ID information in the access ticket included in said job with user ID information in the access ticket included in said job management command; and

reply means for replying all information related to said job when the user ID information is identical in both access tickets, and for replying only a part of the information related to said job when the user ID information is not identical in the access tickets,

wherein said job management command is a command for obtaining job information in said peripheral equipment.

[Claim 6]

The peripheral equipment according to any one of claims 1 to 5, wherein said job and said job management command are received through a console attached to said peripheral equipment or the network.

[Claim 7]

Peripheral equipment managed by a directory server connected through a network, for managing

equipment sent in accordance with an equipment management command received, comprising:

decrypting means for decrypting an access ticket included in said job; and

managing means for managing said equipment in accordance with the decrypted contents of the access ticket included in said equipment management command.

[Claim 8]

Peripheral equipment managed by a directory server connected through a network, for managing equipment sent in accordance with an equipment management command received, comprising:

decrypting means for decrypting an access ticket included in said equipment management command;

storing means for storing said decrypted access ticket included in the equipment management command;

issuing means for issuing a session key for said stored access ticket;

obtaining means for obtaining said stored access ticket in accordance with said session key included in said equipment management command; and

managing means for managing said equipment in accordance with the decrypted contents of said obtained access ticket.

[Claim 9]

An information processing apparatus connected to peripheral equipment and a directory server through a

network, for causing said peripheral equipment to perform job management, comprising:

issuance requesting means for requesting an issue of an access ticket to said directory server;

command generating means for generating a job management command including said generated access ticket; and

command issuing means for issuing said generated job management command to said peripheral equipment.

[Claim 10]

An information processing apparatus connected to peripheral equipment and a directory server through a network, for causing said peripheral equipment to perform job management, comprising:

issuance requesting means for requesting an issue of an access ticket to said directory server;

first command issuing means for setting said issued access ticket and generating a management command for obtaining a session key to issue the command to said peripheral equipment; and

second command issuing means for generating a job management command including said obtained session key to issue said command to said peripheral equipment.

[Claim 11]

The information processing apparatus according to claim 9 or 10, wherein said job management command is a command for canceling the instructed job.

[Claim 12]

The information processing apparatus according to claim 9 or 10, wherein said job management command is a command for obtaining job information in said peripheral equipment.

[Claim 13]

An information processing apparatus connected to peripheral equipment and a directory server through a network, for causing said peripheral equipment to perform equipment management, comprising:

issuance requesting means for requesting an issue of an access ticket to said directory server;

command generating means for generating a equipment management command including said issued access ticket; and

command issuing means for issuing said generated equipment management command to said peripheral equipment.

[Claim 14]

An information processing apparatus connected to peripheral equipment and a directory server through a network, for causing said peripheral equipment to perform equipment management, comprising:

issuance requesting means for requesting an issue of an access ticket to said directory server;

first command issuing means for setting said issued access ticket and generating a management

command for obtaining a session key to issue the command to said peripheral equipment; and

second command issuing means for generating an equipment management command including said obtained session key to issue said command to said peripheral equipment.

[Claim 15]

A peripheral equipment control system connected to an information processing apparatus, directory server and peripheral equipment through a network, said peripheral equipment adapted to manage a job sent from said information processing apparatus through said network, wherein:

said information processing apparatus comprises:

issuance requesting means for requesting an issue of an access ticket to said directory server;

command generating means for generating a job management command including said issued access ticket; and

command issuing means for issuing said generated job management command to said peripheral equipment, and

said peripheral equipment comprises:

first decrypting means for decrypting an access ticket included in said job;

second decrypting means for decrypting an access ticket included in the job management command; and

managing means for managing said job in accordance with the decrypted contents of the access ticket included in said job and the access ticket included in said job management command.

[Claim 16]

A peripheral equipment control system connected to an information processing apparatus, directory server and peripheral equipment through a network, said peripheral equipment adapted to manage a job sent from said information processing apparatus through said network, wherein:

said information apparatus comprises:

issuance requesting means for requesting an issue of an access ticket to said directory server;

first command issuing means for setting said issued access ticket and generating a management command for obtaining a session key to issue the command to said peripheral equipment; and

second command issuing means for generating a job management command including said obtained session key to issue said command to said peripheral equipment, and

said peripheral equipment comprises:

first decrypting means for decrypting an access ticket included in said job;

second decrypting means for decrypting an access ticket included in the job management command;

storing means for storing said decrypted access ticket included in the job management command;

issuing means for issuing a session key for said stored access ticket;

obtaining means for obtaining said stored access ticket in accordance with said session key included in said job management command; and

managing means for managing said job in accordance with the decrypted contents of the access ticket included in said job and said obtained access ticket.

[Claim 17]

A management method of peripheral equipment for managing a job sent from an external device in accordance with a received job management command, comprising:

a step of decrypting an access ticket included in said job;

a step of decrypting an access ticket included in the job management command; and

a step of managing said job in accordance with the decrypted contents of the access ticket included in said job and the access ticket included in said job management command.

[Claim 18]

A management method of peripheral equipment for managing a job sent from an external device in

accordance with a received job management command,
comprising:

- a step of decrypting an access ticket included
in said job;

- a step of decrypting an access ticket included
in the job management command;

- a step of storing said decrypted access ticket
included in the job management command;

- a step of issuing a session key for said stored
access ticket;

- a step of obtaining said stored access ticket in
accordance with said session key included in said job
management command; and

- a step of managing said job in accordance with
the decrypted contents of the access ticket included in
said job and said obtained access ticket.

[Claim 19]

A management method of peripheral equipment for
performing equipment management in accordance with a
received equipment management command, comprising:

- a step of decrypting an access ticket included
in said equipment management command; and

- a step of managing said equipment in accordance
with the decrypted contents of the access ticket
included in said equipment management command.

[Claim 20]

A management method of peripheral equipment for

performing equipment management in accordance with a received equipment management command, comprising:

- a step of decrypting an access ticket included in said equipment management command;

- a step of storing said decrypted access ticket included in the equipment management command;

- a step of issuing a session key for said stored access ticket;

- a step of obtaining said stored access ticket in accordance with said session key included in said equipment management command; and

- a step of managing said equipment in accordance with the decrypted contents of said obtained access ticket.

[Claim 21]

A management method of an information processing apparatus connected to peripheral equipment and a directory server through a network for causing said peripheral equipment to execute job management, comprising:

- a step of requesting an issue of an access ticket to said directory server;

- a step of generating a job management command including said issued access ticket; and

- a step of issuing said generated job management command to said peripheral equipment.

[Claim 22]

A management method of an information processing apparatus connected to peripheral equipment and a directory server through a network for causing said peripheral equipment to execute job management, comprising:

a step of requesting an issue of an access ticket to said directory server;

a step of setting said issued access ticket and generating a management command for obtaining a session key to issue the command to said peripheral equipment; and

a step of generating a job management command including said obtained session key to issue said command to said peripheral equipment.

[Claim 23]

The management method according to claim 17, 18, 21 or 22, wherein said job management command is a command for canceling the instructed job.

[Claim 24]

The management method according to claim 17, 18, 21 or 22, wherein said job management command is a command for obtaining job information in said peripheral equipment.

[Claim 25]

A management method of an information processing apparatus connected to peripheral equipment and a directory server through a network for causing said

peripheral equipment to execute equipment management, comprising:

- a step of requesting an issue of an access ticket to said directory server;
- a step of generating an equipment management command including said issued access ticket; and
- a step of issuing said generated equipment management command to said peripheral equipment.

[Claim 26]

A management method of an information processing apparatus connected to peripheral equipment and a directory server through a communication line for causing said peripheral equipment to execute equipment management, comprising:

- a step of requesting an issue of an access ticket to said directory server;
- a step of setting said issued access ticket and generating a management command for obtaining a session key to issue the command to said peripheral equipment; and
- a step of generating an equipment management command including said obtained session key to issue said command to said peripheral equipment.

[Claim 27]

A management software including a program to be executed by a computer in peripheral equipment for managing a job sent from an external device in

accordance with a received job management command,
wherein said program includes:

- a procedure for decrypting an access ticket
included in said job;

- a procedure for decrypting an access ticket
included in the job management command; and

- a procedure for managing said job in accordance
with the decrypted contents of the access ticket
included in said job and the access ticket included in
said job management command.

[Claim 28]

A management software including a program to be
executed by a computer in peripheral equipment for
managing a job sent from an external device in
accordance with a received job management command,
wherein said program includes:

- a procedure for decrypting an access ticket
included in said job;

- a procedure for decrypting an access ticket
included in the job management command;

- a procedure for storing said decrypted access
ticket included in the job management command;

- a procedure for issuing a session key for said
stored access ticket;

- a procedure for obtaining said stored access
ticket in accordance with said session key included in
said job management command; and

a procedure for managing said job in accordance with the decrypted contents of the access ticket included in said job and said obtained access ticket.

[Claim 29]

A management software including a program to be executed by a computer of peripheral equipment for performing equipment management in accordance with a received equipment management command, wherein said program includes:

a procedure for decrypting an access ticket included in said equipment management command; and

a procedure for managing said equipment in accordance with the decrypted contents of the access ticket included in said equipment management command.

[Claim 30]

A management software including a program to be executed by a computer of peripheral equipment for performing equipment management in accordance with a received equipment management command, wherein said program includes:

a procedure for decrypting an access ticket included in said equipment management command;

a procedure for storing said decrypted access ticket included in the equipment management command;

a procedure for issuing a session key for said stored access ticket;

a procedure for obtaining said stored access

ticket in accordance with said session key included in said equipment management command; and

a procedure for managing said equipment in accordance with the decrypted contents of said obtained access ticket.

[Claim 31]

A management software including a program to be executed by a computer in an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing said peripheral equipment to perform job management, wherein

said program includes:

a procedure for requesting an issue of an access ticket to said directory server;

a procedure for generating a job management command including said issued access ticket; and

a procedure for issuing said generated job management command to said peripheral equipment.

[Claim 32]

A management software including a program to be executed by a computer in an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing said peripheral equipment to perform job management, wherein

said program includes:

a procedure for requesting an issue of an access ticket to said directory server;

a procedure for setting said issued access ticket and generating a management command for obtaining a session key to issue the command to said peripheral equipment; and

a procedure for generating a job management command including said obtained session key to issue said command to said peripheral equipment.

[Claim 33]

The management software according to claim 27, 28, 31 or 32, wherein said job management command is a command for canceling the instructed job.

[Claim 34]

The management software according to claim 27, 28, 31 or 32, wherein said job management command is a command for obtaining job information in said peripheral equipment.

[Claim 35]

A management software including a program to be executed by a computer in an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing said peripheral equipment to perform equipment management, wherein said program includes:

a procedure for requesting an issue of an access ticket to said directory server;

a procedure for generating an equipment management command including said issued access ticket;

and

a procedure for issuing said generated equipment management command to said peripheral equipment.

[Claim 36]

A management software including a program to be executed by a computer in an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing said peripheral equipment to perform equipment management, wherein said program includes:

a procedure for requesting an issue of an access ticket to said directory server;

a procedure for setting said issued access ticket and generating a management command for obtaining a session key to issue the command to said peripheral equipment; and

a procedure for generating an equipment management command including said obtained session key to issue said command to said peripheral equipment.

[Claim 37]

A storage medium storing a program to be executed by a computer in peripheral equipment for managing a job sent from an external device in accordance with a received job management command, wherein said program includes:

a procedure for decrypting an access ticket included in said job;

a procedure for decrypting an access ticket included in the job management command; and

a procedure for managing said job in accordance with the decrypted contents of the access ticket included in said job and the access ticket included in said job management command.

[Claim 38]

A storage medium storing a program to be executed by a computer in peripheral equipment for managing a job sent from an external device in accordance with a received job management command, wherein said program includes:

a procedure for decrypting an access ticket included in said job;

a procedure for decrypting an access ticket included in the job management command;

a procedure for storing said decrypted access ticket included in the job management command;

a procedure for issuing a session key for said stored access ticket;

a procedure for obtaining said stored access ticket in accordance with said session key included in said job management command; and

a procedure for managing said job in accordance with the decrypted contents of the access ticket included in said job and said obtained access ticket.

[Claim 39]

A storage medium storing a program to be executed by a computer in peripheral equipment for performing equipment management in accordance with a received equipment management command, wherein said program includes:

- a procedure for decrypting an access ticket included in said equipment management command; and

- a procedure for managing said equipment in accordance with the decrypted contents of the access ticket included in said equipment management command.

[Claim 40]

A storage medium storing a program to be executed by a computer in peripheral equipment for performing equipment management in accordance with a received equipment management command, wherein said program includes:

- a procedure for decrypting an access ticket included in said equipment management command;

- a procedure for storing said decrypted access ticket included in the equipment management command;

- a procedure for issuing a session key for said stored access ticket;

- a procedure for obtaining said stored access ticket in accordance with said session key included in said equipment management command; and

- a procedure for managing said equipment in accordance with the decrypted contents of said obtained

access ticket.

[Claim 41]

A storage medium storing a program to be executed by a computer in an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing said peripheral equipment to perform job management, wherein said program includes:

- a procedure for requesting an issue of an access ticket to said directory server;

- a procedure for generating a job management command including said issued access ticket; and

- a procedure for issuing said generated job management command to said peripheral equipment.

[Claim 42]

A storage medium storing a program to be executed by a computer in an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing said peripheral equipment to perform job management, wherein said program includes:

- a procedure for requesting an issue of an access ticket to said directory server;

- a procedure for setting said issued access ticket and generating a management command for obtaining a session key to issue the command to said peripheral equipment; and

a procedure for generating a job management command including said obtained session key to issue said command to said peripheral equipment.

[Claim 43]

The management software according to claim 37, 38, 41 or 42, wherein said job management command is a command for canceling the instructed job.

[Claim 44]

The management software according to claim 37, 38, 41 or 42, wherein said job management command is a command for obtaining job information in said peripheral equipment.

[Claim 45]

A storage medium storing a program to be executed by a computer in an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing said peripheral equipment to perform equipment management, wherein said program includes:

a procedure for requesting an issue of an access ticket to said directory server;

a procedure for generating an equipment management command including said issued access ticket;
and

a procedure for issuing said generated equipment management command to said peripheral equipment.

[Claim 46]

A storage medium including a program to be executed by a computer in an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing said peripheral equipment to perform equipment management, wherein said program includes:

- a procedure for requesting an issue of an access ticket to said directory server;

- a procedure for setting said issued access ticket and generating a management command for obtaining a session key to issue the command to said peripheral equipment; and

- a procedure for generating an equipment management command including said obtained session key to issue said command to said peripheral equipment.

[Claim 47]

The peripheral equipment according to claim 1 or 2, further comprising:

- storing means for storing attribute information indicating a function of the equipment, a state of the equipment, a job state, and so on; and

- acquisition setting execution means for acquiring and setting the stored attribute information under instruction of the information processing apparatus connected to said network,

- wherein said attribute information includes a list of types of said usable directory servers.

[Claim 48]

The peripheral equipment according to claim 1 or 2, further comprising:

storing means for storing attribute information indicating a function of the equipment, a state of the equipment, a job state, and so on; and

acquisition setting execution means for acquiring and setting the stored attribute information under instruction of the information processing apparatus connected to said network,

wherein said attribute information includes the type of a currently used directory server.

[Claim 49]

The management method according to claim 21 or 22, further comprising:

a step of acquiring said attribute information by said information processing apparatus from said peripheral equipment; and

a step of sending a control command in accordance with said acquired attribute information,

wherein said attribute information includes a list of types of said usable directory servers.

[Claim 50]

The management method according to claim 21 or 22, further comprising:

a step of acquiring said attribute information by said information processing apparatus from said

peripheral equipment; and

a step of sending a control command in accordance with said acquired attribute information, wherein said attribute information includes the type of a currently used directory server.

[Claim 51]

The management software according to claim 31 or 32, wherein said program comprises:

a procedure for acquiring said attribute information from said peripheral equipment; and

a procedure for sending a control command in accordance with said acquired attribute information, wherein said attribute information includes a list of types of said usable directory servers.

[Claim 52]

The management software according to claim 31 or 32, wherein said program comprises:

a procedure for acquiring said attribute information from said peripheral equipment; and

a procedure for sending a control command in accordance with said acquired attribute information, wherein said attribute information includes the type of a currently used directory server.

[Claim 53]

The management software according to claim 31 or 32, wherein said program comprises:

a procedure for acquiring said attribute

information from said peripheral equipment; and

a procedure for sending a control command in accordance with said acquired attribute information, wherein said attribute information includes a list of types of said usable directory servers.

[Claim 54]

The management software according to claim 31 or 32, wherein said program comprises:

a procedure for acquiring said attribute information from said peripheral equipment; and

a procedure for sending a control command in accordance with said acquired attribute information, wherein said attribute information includes the type of a currently used directory server.

[Claim 55]

The storage medium according to claim 41 or 42, wherein said program comprises:

a procedure for acquiring said attribute information from said peripheral equipment; and

a procedure for sending a control command in accordance with said acquired attribute information, wherein said attribute information includes a list of types of said usable directory servers.

[Claim 56]

The storage medium according to claim 41 or 42, wherein said program comprises:

a procedure for acquiring said attribute

information from said peripheral equipment; and
a procedure for sending a control command in
accordance with said acquired attribute information,
wherein said attribute information includes the
type of a currently used directory server.

[Claim 57]

The peripheral equipment according to claim 1 or
2, which has a console to be operated by a user, is
connected to said directory server by using user
information entering through said console, and further
comprises an acquisition means for acquiring an access
ticket for the pertinent peripheral equipment of the
user.

[Claim 58]

The peripheral equipment according to claim 1 or
2, which decrypts the access ticket included in a job
received through said network, and is operated in
accordance with the contents of said decrypted access
ticket.

[Claim 59]

The peripheral equipment according to claim 57
or 58, wherein said access ticket includes user
information, which peripheral equipment comprising
recording means for recording the number of prints
printed in accordance with said user information and
said job as a log.

[Claim 60]

The peripheral equipment according to claim 57 or 58, wherein said access ticket includes user information, which peripheral equipment comprising sending means for sending the number of prints printed in accordance with said user information and said job to said directory server connected through said network.

[Claim 61]

The peripheral equipment according to claim 57 or 58, wherein said access ticket includes the permitted maximum number of prints, which peripheral equipment comprising:

determining means for determining whether the job is to be received or not on the basis of said permitted maximum number of prints; and

finishing means for finishing said job when the actual number of prints exceeds said permitted maximum number of prints.

[Claim 62]

The peripheral equipment according to claim 57 or 58, wherein said access ticket includes user information which peripheral equipment comprising:

obtaining means for obtaining the permitted maximum number of prints of the concerned user retained in said directory server by using said user information immediately before the execution of a job;

determining means for determining whether the job is to be received or not on the basis of said

permitted maximum number of prints; and

finishing means for finishing said job when the actual number of prints exceeds said permitted maximum number of prints.

[Claim 63]

The peripheral equipment according to claim 57, wherein said attribute information has a list of operation modes to be taken in the case of a failure of connecting to the directory server and a current operation mode to be taken in the case of a failure of connecting to the directory server, which peripheral equipment comprising acquisition setting execution means for acquiring and setting said attribute information under instruction of the information processing apparatus connected to said network.

[Claim 64]

The peripheral equipment according to claim 57, further comprising:

comparing means for comparing user information temporarily stored with user information received from said console,

wherein an operation mode to be taken in the case of a failure of connecting to the directory server is a mode for performing an operation when said user information temporarily stored and the user information received from said console coincide.

[Claim 65]

The peripheral equipment according to claim 57,
further comprising:

comparing means for comparing user information
temporarily stored with user information received from
said console,

wherein an operation mode to be taken in the
case of a failure of connecting to the directory server
is a mode for performing an operation within a
predetermined limit period of time from normal
acquisition of an access ticket when said user
information temporarily stored and the user information
received from said console coincide.

[Claim 66]

The peripheral equipment according to claim 57,
further comprising:

comparing means for comparing user information
temporarily stored with user information received from
said console,

wherein an operation mode to be taken in the
case of a failure of connecting to the directory server
is a mode for performing an operation within a
predetermined limit period of time from normal
acquisition of an access ticket and within the maximum
permitted number of prints stored in the equipment in
advance when said user information temporarily stored
and the user information received from said console
coincide.

[Claim 67]

The peripheral equipment according to claim 57,
further comprising:

comparing means for comparing user information
temporarily stored with user information received from
said console,

wherein an operation mode to be taken in the
case of a failure of connecting to the directory server
is a mode for performing an operation within a a
predetermined limit period of time from normal
acquisition of an access ticket and within the maximum
permitted number of prints for the concerned user in
the user information temporarily stored when said user
information temporarily stored and the user information
received from said console coincide.

[Claim 68]

The peripheral equipment according to claim 57,
further comprising:

comparing means for comparing user information
temporarily stored with user information received from
said console,

wherein an operation mode to be taken in the
case of a failure of connecting to the directory server
is a mode for performing an operation within the
maximum permitted number of prints stored in the
equipment in advance when said user information
temporarily stored and the user information received

from said console coincide.

[Claim 69]

The peripheral equipment according to claim 57, further comprising:

comparing means for comparing user information temporarily stored with user information received from said console,

wherein an operation mode to be taken in the case of a failure of connecting to the directory server is a mode for performing an operation within the maximum permitted number of prints for the concerned user in the user information temporarily stored when said user information temporarily stored and the user information received from said console coincide.

[Claim 70]

The peripheral equipment according to claim 57, further comprising:

comparing means for comparing user information temporarily stored with user information received from said console,

wherein an operation mode to be taken in the case of a failure of connecting to the directory server is a mode for performing an operation within the maximum permitted number of prints for each user session stored in the equipment in advance when said user information temporarily stored and the user information received from said console coincide.

[Claim 71]

The peripheral equipment according to claim 57, further comprising:

comparing means for comparing user information temporarily stored with user information received from said console,

wherein an operation mode to be taken in the case of a failure of connecting to the directory server is a mode for prohibiting the use of the peripheral equipment by the user.

[Claim 72]

The peripheral equipment according to claim 57, wherein the maximum permitted number of prints stored in the equipment in advance is reduced in proportion to the time from the normal acquisition of an access ticket.

[Claim 73]

The management method according to claim 17 or 18, further comprising a step of connecting to the directory server by using the user information received from the console to acquire an access ticket to the peripheral equipment of the pertinent user.

[Claim 74]

The management method according to claim 17 or 18, further comprising a step of decrypting the access ticket included in the job received through said network so as to operate in accordance with the

contents of the decrypted access ticket.

[Claim 75]

The management software according to claim 26 or 27, wherein said program includes a procedure for connecting to said directory server by using the user information received from the console so as to obtain an access ticket to the peripheral equipment of the pertinent user.

[Claim 76]

The management software according to claim 26 or 27, wherein said program includes a procedure for decrypting the access ticket included in the job received through said network so as to operate in accordance with the contents of the decrypted access ticket.

[Claim 77]

The storage medium according to claim 37 or 38, wherein said program includes a procedure for connecting to said directory server by using the user information received from the console so as to obtain an access ticket to the peripheral equipment of the pertinent user.

[Claim 78]

The storage medium according to claim 37 or 38, wherein said program includes a procedure for decrypting the access ticket included in the job received through said network so as to operate in

accordance with the contents of the decrypted access ticket.

[Detailed Description of the Invention]

[0001]

[Field of the Industrial Utilization]

The present invention relates to control of peripheral equipment such as a printer, a scanner, a copier and a facsimile, setting of a corresponding directory server, management of user information of the peripheral equipment, peripheral equipment for managing the number of prints, etc., an information processing apparatus, a peripheral equipment control system, a management method, a management software and a storage medium.

[0002]

[Prior Art]

In the past, it was possible, in the peripheral equipment such as a printer, a copier, and a facsimile (FAX), to perform management of jobs (displaying a job list, canceling a specified job and so on) of which operation or execution is pending in the equipment from a computer connected to the equipment via a console of the equipment or a network and so on.

[0003]

Also, in the past, in the peripheral equipment capable of having a job or a control command to include an access ticket issued from a directory server, it is

required to decrypt the access ticket by using a cryptograph key. However, it is also required to set a directory server of a type corresponding to the peripheral equipment in advance since a cryptosystem used for the cryptanalysis and a format of the access ticket vary depending on a type of the directory server.

[0004]

Further, in the past, the peripheral equipment such as the copier and the facsimile performed user authentication, in order to perform user information management, by displaying a dialog for performing user authentication on the console and having user information inputted thereon. The user information obtained here was checked against a database of the user information managed inside the equipment so that use permission of the user was issued in the case where they coincided. Moreover, in the case where some printing was performed as a result of user operation, the number of prints was logged together with the user information obtained on a login or accumulated on a counter for each user so as to manage the number of prints for each user.

[0005]

In addition, in the past, the peripheral equipment such as the printer and the copier performed, by discrete devices, management of the numbers of prints such as management of the accumulated number of

prints for each user and limitation by the maximum number of prints. In this case, it was performed by providing in the equipment a counter for representing the accumulated printing, and ending printing or refusing to accept a job when this value becomes a predetermined value.

[0006]

[Problems to be Solved by the Invention]

However, when the equipment which issues the job is different from the equipment which manages the job, in order to issue a print job from, for example, a computer to a copier and then to cancel this job through a console on the copier, since the information used for login in the computer is different from the information used for login in the copier, it is not possible to see whether or not the job is managed by the issuer of the job, which resultantly is a problem in terms of the access control in the job management. Also, according to the present invention, the means for including user information in a management command is used to perform a unified access control. However, the data size of the user information usually becomes too large, and the data size of the management command including this user information also becomes large, which may arise a problem on the network and the performance.

[0007]

Still, when the type of the corresponding director server is to be set from a peripheral equipment control software operating on a computer connected through a network, or the like, it is necessary to store in advance the information indicating that which director server the peripheral equipment to be used can cope with. As a result, it is difficult to prepare a general-purpose peripheral equipment control software capable of coping with any type of peripheral equipment.

[0008]

Still further, since the user information management has been performed by a single piece of equipment, it is difficult to unify the user information, under the environment where a plural pieces of equipment are used, to be managed by these plural pieces of equipment. For example, there arises a problem that, if the plural pieces of equipment use the same user ID, this user ID does not always identify the same user. Moreover, if the maximum permitted number of prints is set for each user in one piece of equipment, this setting does not have any influence on other pieces of equipment. As a result, it is difficult to manage the maximum number of prints under such environment.

[0009]

Since the user information management has been

performed by a single piece of equipment, it is difficult to unify the user information, under the environment where a plural pieces of equipment are used, to be managed by these plural pieces of equipment. For example, there arises a problem that, if the plural pieces of equipment use the same user ID, this user ID does not always identify the same user. Moreover, if the maximum permitted number of prints is set for each user in one piece of equipment, this setting does not have any influence on other pieces of equipment. As a result, it is difficult to manage the maximum number of prints under such environment.

[0010]

Therefore, an object of the present invention is, in terms of the job management in a network environment, to provide peripheral equipment, an information processing apparatus, a peripheral equipment control system, a management method, management software and a storage media that allows a unified access control. Another object of the present invention is, in terms of job management in a network environment, to provide peripheral equipment, an information processing apparatus, a peripheral equipment control system, a management method, a management software and a storage media capable of performing the unified access control without deteriorating performance.

[0011]

Another object of the present invention is to provide peripheral equipment, an information processing apparatus, a peripheral equipment control system, a management method, a management software and a storage media for general purpose for which the peripheral equipment control software to be used is not required to have the information on the type of corresponding directory server.

[0012]

Still another object of the present invention is to provide peripheral equipment, an information processing apparatus, a peripheral equipment control system, a management method, a management software and a storage media which perform unified management of user information under the environment where plural pieces of equipment connected to a network, or the like, are used and in which the same user information can be used by the plural pieces of equipment. Still another object of the present invention is to provide peripheral equipment, an information processing apparatus, a peripheral equipment control system, a management method, a management software and a storage media capable of performing centralized management of the accumulated number of prints for each user and the maximum permitted number of prints under the environment where plural pieces of equipment connected to a network, or the like, are used. Still another

object of the present invention is to provide peripheral equipment, an information processing apparatus, a peripheral equipment control system, a management method, a management software and a storage media capable of using the peripheral equipment temporarily in the case of failure of the network.

[0013]

[Means for Solving the Problems]

To attain the above objects, according to claim 1 of the present invention, there is provided peripheral equipment managed by a directory server connected through a network, for managing a job sent from an external device in accordance with a job management command received, comprising: first decrypting means for decrypting an access ticket included in the job; second decrypting means for decrypting an access ticket included in the job management command; and managing means for managing the job in accordance with the decrypted contents of the access ticket included in the job and the access ticket included in the job management command.

[0014]

According to claim 2 of the present invention, there is provided peripheral equipment managed by a directory server connected through a network, for managing a job sent from an external device in accordance with a job management command received,

comprising: first decrypting means for decrypting an access ticket included in the job; second decrypting means for decrypting an access ticket included in the job management command; storing means for storing the decrypted access ticket included in the job management command; issuing means for issuing a session key for the stored access ticket; obtaining means for obtaining the stored access ticket in accordance with the session key included in the job management command; and managing means for managing the job in accordance with the decrypted contents of the access ticket included in the job and the obtained access ticket.

[0015]

The peripheral equipment further comprises: comparing means for comparing user ID information in the access ticket included in the job with user ID information in the access ticket included in the job management command; and instructed operation executing means for performing an operation instructed by the job management command when the user ID information is identical in both access tickets.

[0016]

Further, the job management command described above is a command for canceling the instructed job.

[0017]

Also, the peripheral equipment is characterized in that the job management command is a command for

obtaining job information in the peripheral equipment and further comprises: comparing means for comparing user ID information in the access ticket included in the job with user ID information in the access ticket included in the job management command; and reply means for replying all information related to the job when the user ID information is identical in both access tickets, and for replying only a part of the information related to the job when the user ID information is not identical in the access tickets.

[0018]

Further, the job and the job management command are received through a console attached to the peripheral equipment or the network.

[0019]

According to claim 7 of the present invention, there is provided peripheral equipment managed by a directory server connected through a network, for managing equipment sent in accordance with an equipment management command received, comprising: decrypting means for decrypting an access ticket included in the job; and managing means for managing the equipment in accordance with the decrypted contents of the access ticket included in the equipment management command.

[0020]

According to claim 8 of the present invention, there is provided peripheral equipment managed by a

directory server connected through a network, for managing equipment sent in accordance with an equipment management command received, comprising: decrypting means for decrypting an access ticket included in the equipment management command; storing means for storing the decrypted access ticket included in the equipment management command; issuing means for issuing a session key for the stored access ticket; obtaining means for obtaining the stored access ticket in accordance with the session key included in the equipment management command; and managing means for managing the equipment in accordance with the decrypted contents of the obtained access ticket.

[0021]

According to claim 9 of the present invention, there is provided an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing the peripheral equipment to perform job management, comprising: issuance requesting means for requesting an issue of an access ticket to the directory server; command generating means for generating a job management command including the generated access ticket; and command issuing means for issuing the generated job management command to the peripheral equipment.

[0022]

There is also provided an information processing

apparatus connected to peripheral equipment and a directory server through a network, for causing the peripheral equipment to perform job management, comprising: issuance requesting means for requesting an issue of an access ticket to the directory server; first command issuing means for setting the issued access ticket and generating a management command for obtaining a session key to issue the command to the peripheral equipment; and second command issuing means for generating a job management command including the obtained session key to issue the command to the peripheral equipment.

[0023]

Further, the job management command described above is a command for canceling the instructed job.

[0024]

Also, the job management command described above is a command for obtaining job information in the peripheral equipment.

[0025]

According to claim 13 of the present invention, there is provided an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing the peripheral equipment to perform equipment management, comprising: issuance requesting means for requesting an issue of an access ticket to the directory server; command

generating means for generating a equipment management command including the issued access ticket; and command issuing means for issuing the generated equipment management command to the peripheral equipment.

[0026]

According to claim 14 of the present invention, there is provided an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing the peripheral equipment to perform equipment management, comprising: issuance requesting means for requesting an issue of an access ticket to the directory server; first command issuing means for setting the issued access ticket and generating a management command for obtaining a session key to issue the command to the peripheral equipment; and second command issuing means for generating an equipment management command including the obtained session key to issue the command to the peripheral equipment.

[0027]

According to claim 15 of the present invention, there is provided a peripheral equipment control system connected to an information processing apparatus, directory server and peripheral equipment through a network, the peripheral equipment adapted to manage a job sent from the information processing apparatus through the network, wherein: the information

processing apparatus comprises: issuance requesting means for requesting an issue of an access ticket to the directory server; command generating means for generating a job management command including the issued access ticket; and command issuing means for issuing the generated job management command to the peripheral equipment, and the peripheral equipment comprises: first decrypting means for decrypting an access ticket included in the job; second decrypting means for decrypting an access ticket included in the job management command; and managing means for managing the job in accordance with the decrypted contents of the access ticket included in the job and the access ticket included in the job management command.

[0028]

According to claim 16 of the present invention, there is provided a peripheral equipment control system connected to an information processing apparatus, directory server and peripheral equipment through a network, the peripheral equipment adapted to manage a job sent from the information processing apparatus through the network, wherein: the information apparatus comprises: issuance requesting means for requesting an issue of an access ticket to the directory server; first command issuing means for setting the issued access ticket and generating a management command for obtaining a session key to issue the command to the

peripheral equipment; and second command issuing means for generating a job management command including the obtained session key to issue the command to the peripheral equipment, and the peripheral equipment comprises: first decrypting means for decrypting an access ticket included in the job; second decrypting means for decrypting an access ticket included in the job management command; storing means for storing the decrypted access ticket included in the job management command; issuing means for issuing a session key for the stored access ticket; obtaining means for obtaining the stored access ticket in accordance with the session key included in the job management command; and managing means for managing the job in accordance with the decrypted contents of the access ticket included in the job and the obtained access ticket.

[0029]

According to claim 17 of the present invention, there is provided a management method of peripheral equipment for managing a job sent from an external device in accordance with a received job management command, comprising: a step of decrypting an access ticket included in the job; a step of decrypting an access ticket included in the job management command; and a step of managing the job in accordance with the decrypted contents of the access ticket included in the job and the access ticket included in the job

management command.

[0030]

According to claim 18 of the present invention, there is provided a management method of peripheral equipment for managing a job sent from an external device in accordance with a received job management command, comprising: a step of decrypting an access ticket included in the job; a step of decrypting an access ticket included in the job management command; a step of storing the decrypted access ticket included in the job management command; a step of issuing a session key for the stored access ticket; a step of obtaining the stored access ticket in accordance with the session key included in the job management command; and a step of managing the job in accordance with the decrypted contents of the access ticket included in the job and the obtained access ticket.

[0031]

According to claim 19 of the present invention, there is provided a management method of peripheral equipment for performing equipment management in accordance with a received equipment management command, comprising: a step of decrypting an access ticket included in the equipment management command; and a step of managing the equipment in accordance with the decrypted contents of the access ticket included in the equipment management command.

[0032]

According to claim 20 of the present invention, there is provided a management method of peripheral equipment for performing equipment management in accordance with a received equipment management command, comprising: a step of decrypting an access ticket included in the equipment management command; a step of storing the decrypted access ticket included in the equipment management command; a step of issuing a session key for the stored access ticket; a step of obtaining the stored access ticket in accordance with the session key included in the equipment management command; and a step of managing the equipment in accordance with the decrypted contents of the obtained access ticket.

[0033]

According to claim 21 of the present invention, there is provided a management method of an information processing apparatus connected to peripheral equipment and a directory server through a network for causing the peripheral equipment to execute job management, comprising: a step of requesting an issue of an access ticket to the directory server; a step of generating a job management command including the issued access ticket; and a step of issuing the generated job management command to the peripheral equipment.

[0034]

According to claim 22 of the present invention, there is provided a management method of an information processing apparatus connected to peripheral equipment and a directory server through a network for causing the peripheral equipment to execute job management, comprising: a step of requesting an issue of an access ticket to the directory server; a step of setting the issued access ticket and generating a management command for obtaining a session key to issue the command to the peripheral equipment; and a step of generating a job management command including the obtained session key to issue the command to the peripheral equipment.

Also, the job management command described above is a command for canceling the instructed job.

[0035]

Further, the job management command described above is a command for obtaining job information in the peripheral equipment.

[0036]

According to claim 25 of the present invention, there is provided a management method of an information processing apparatus connected to peripheral equipment and a directory server through a network for causing the peripheral equipment to execute equipment management, comprising: a step of requesting an issue of an access ticket to the directory server; a step of

generating an equipment management command including the issued access ticket; and a step of issuing the generated equipment management command to the peripheral equipment.

[0037]

According to claim 26 of the present invention, there is provided a management method of an information processing apparatus connected to peripheral equipment and a directory server through a communication line for causing the peripheral equipment to execute equipment management, comprising: a step of requesting an issue of an access ticket to the directory server; a step of setting the issued access ticket and generating a management command for obtaining a session key to issue the command to the peripheral equipment; and a step of generating an equipment management command including the obtained session key to issue the command to the peripheral equipment.

[0038]

According to claim 27 of the present invention, there is provided a management software including a program to be executed by a computer in peripheral equipment for managing a job sent from an external device in accordance with a received job management command, wherein the program includes: a procedure for decrypting an access ticket included in the job; a procedure for decrypting an access ticket included in

the job management command; and a procedure for managing the job in accordance with the decrypted contents of the access ticket included in the job and the access ticket included in the job management command.

[0039]

According to claim 28 of the present invention, there is provided a management software including a program to be executed by a computer in peripheral equipment for managing a job sent from an external device in accordance with a received job management command, wherein the program includes: a procedure for decrypting an access ticket included in the job; a procedure for decrypting an access ticket included in the job management command; a procedure for storing the decrypted access ticket included in the job management command; a procedure for issuing a session key for the stored access ticket; a procedure for obtaining the stored access ticket in accordance with the session key included in the job management command; and a procedure for managing the job in accordance with the decrypted contents of the access ticket included in the job and the obtained access ticket.

[0040]

According to claim 29 of the present invention, there is provided a management software including a program to be executed by a computer of peripheral

equipment for performing equipment management in accordance with a received equipment management command, wherein the program includes: a procedure for decrypting an access ticket included in the equipment management command; and a procedure for managing the equipment in accordance with the decrypted contents of the access ticket included in the equipment management command.

[0041]

According to claim 30 of the present invention, there is provided a management software including a program to be executed by a computer of peripheral equipment for performing equipment management in accordance with a received equipment management command, wherein the program includes: a procedure for decrypting an access ticket included in the equipment management command; a procedure for storing the decrypted access ticket included in the equipment management command; a procedure for issuing a session key for the stored access ticket; a procedure for obtaining the stored access ticket in accordance with the session key included in the equipment management command; and a procedure for managing the equipment in accordance with the decrypted contents of the obtained access ticket.

[0042]

According to claim 31 of the present invention,

there is provided a management software including a program to be executed by a computer in an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing the peripheral equipment to perform job management, wherein the program includes: a procedure for requesting an issue of an access ticket to the directory server; a procedure for generating a job management command including the issued access ticket; and a procedure for issuing the generated job management command to the peripheral equipment.

[0043]

According to claim 32 of the present invention, there is provided a management software including a program to be executed by a computer in an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing the peripheral equipment to perform job management, wherein the program includes: a procedure for requesting an issue of an access ticket to the directory server; a procedure for setting the issued access ticket and generating a management command for obtaining a session key to issue the command to the peripheral equipment; and a procedure for generating a job management command including the obtained session key to issue the command to the peripheral equipment.

[0044]

Also, the job management command described above is a command for canceling the instructed job.

[0045]

Further, the job management command described above is a command for obtaining job information in the peripheral equipment.

[0046]

According to claim 35 of the present invention, there is provided a management software including a program to be executed by a computer in an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing the peripheral equipment to perform equipment management, wherein the program includes: a procedure for requesting an issue of an access ticket to the directory server; a procedure for generating an equipment management command including the issued access ticket; and a procedure for issuing the generated equipment management command to the peripheral equipment.

[0047]

According to claim 36 of the present invention, there is provided a management software including a program to be executed by a computer in an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing the peripheral equipment to perform equipment

management, wherein the program includes: a procedure for requesting an issue of an access ticket to the directory server; a procedure for setting the issued access ticket and generating a management command for obtaining a session key to issue the command to the peripheral equipment; and a procedure for generating an equipment management command including the obtained session key to issue the command to the peripheral equipment.

[0048]

According to claim 37 of the present invention, there is provided a storage medium storing a program to be executed by a computer in peripheral equipment for managing a job sent from an external device in accordance with a received job management command, wherein the program includes: a procedure for decrypting an access ticket included in the job; a procedure for decrypting an access ticket included in the job management command; and a procedure for managing the job in accordance with the decrypted contents of the access ticket included in the job and the access ticket included in the job management command.

[0049]

According to claim 38 of the present invention, there is provided a storage medium storing a program to be executed by a computer in peripheral equipment for managing a job sent from an external device in

accordance with a received job management command, wherein the program includes: a procedure for decrypting an access ticket included in the job; a procedure for decrypting an access ticket included in the job management command; a procedure for storing the decrypted access ticket included in the job management command; a procedure for issuing a session key for the stored access ticket; a procedure for obtaining the stored access ticket in accordance with the session key included in the job management command; and a procedure for managing the job in accordance with the decrypted contents of the access ticket included in the job and the obtained access ticket.

[0050]

According to claim 39 of the present invention, there is provided a storage medium storing a program to be executed by a computer in peripheral equipment for performing equipment management in accordance with a received equipment management command, wherein the program includes: a procedure for decrypting an access ticket included in the equipment management command; and a procedure for managing the equipment in accordance with the decrypted contents of the access ticket included in the equipment management command.

[0051]

According to claim 40 of the present invention, there is provided a storage medium storing a program to

be executed by a computer in peripheral equipment for performing equipment management in accordance with a received equipment management command, wherein the program includes: a procedure for decrypting an access ticket included in the equipment management command; a procedure for storing the decrypted access ticket included in the equipment management command; a procedure for issuing a session key for the stored access ticket; a procedure for obtaining the stored access ticket in accordance with the session key included in the equipment management command; and a procedure for managing the equipment in accordance with the decrypted contents of the obtained access ticket.

[0052]

According to claim 41 of the present invention, there is provided a storage medium storing a program to be executed by a computer in an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing the peripheral equipment to perform job management, wherein the program includes: a procedure for requesting an issue of an access ticket to the directory server; a procedure for generating a job management command including the issued access ticket; and a procedure for issuing the generated job management command to the peripheral equipment.

[0053]

According to claim 42 of the present invention, there is provided a storage medium storing a program to be executed by a computer in an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing the peripheral equipment to perform job management, wherein the program includes: a procedure for requesting an issue of an access ticket to the directory server; a procedure for setting the issued access ticket and generating a management command for obtaining a session key to issue the command to the peripheral equipment; and a procedure for generating a job management command including the obtained session key to issue the command to the peripheral equipment.

[0054]

Also, the job management command described above is a command for canceling the instructed job.

[0055]

Further, the job management command described above is a command for obtaining job information in the peripheral equipment.

[0056]

According to claim 45 of the present invention, there is provided a storage medium storing a program to be executed by a computer in an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing the

peripheral equipment to perform equipment management, wherein the program includes: a procedure for requesting an issue of an access ticket to the directory server; a procedure for generating an equipment management command including the issued access ticket; and a procedure for issuing the generated equipment management command to the peripheral equipment.

[0057]

According to claim 46 of the present invention, there is provided a storage medium including a program to be executed by a computer in an information processing apparatus connected to peripheral equipment and a directory server through a network, for causing the peripheral equipment to perform equipment management, wherein the program includes: a procedure for requesting an issue of an access ticket to the directory server; a procedure for setting the issued access ticket and generating a management command for obtaining a session key to issue the command to the peripheral equipment; and a procedure for generating an equipment management command including the obtained session key to issue the command to the peripheral equipment.

[0058]

According to claim 47 of the present invention, there is provided a peripheral equipment comprising:

storing means for storing attribute information indicating a function of the equipment, a state of the equipment, a job state, and so on; and acquisition setting execution means for acquiring and setting the stored attribute information under instruction of the information processing apparatus connected to the network, wherein the attribute information includes a list of types of the usable directory servers.

[0059]

The peripheral equipment further comprises: storing means for storing attribute information indicating a function of the equipment, a state of the equipment, a job state, and so on; and acquisition setting execution means for acquiring and setting the stored attribute information under instruction of the information processing apparatus connected to the network, and is characterized in that the attribute information includes the type of a currently used directory server.

[0060]

The management method further comprises: a step of acquiring the attribute information by the information processing apparatus from the peripheral equipment; and a step of sending a control command in accordance with the acquired attribute information, and is characterized in that the attribute information includes a list of types of the usable directory

servers.

[0061]

The management method further comprises: a step of acquiring the attribute information by the information processing apparatus from the peripheral equipment; and a step of sending a control command in accordance with the acquired attribute information, and is characterized in that the attribute information includes the type of a currently used directory server.

[0062]

Further, the management software is characterized in that the program described above comprises: a procedure for acquiring the attribute information from the peripheral equipment; and a procedure for sending a control command in accordance with the acquired attribute information, and the attribute information includes a list of types of the usable directory servers.

[0063]

Also, the management software is characterized in that the program described above comprises a procedure for acquiring the attribute information from the peripheral equipment; and a procedure for sending a control command in accordance with the acquired attribute information, and the attribute information includes the type of a currently used directory server.

[0064]

Further, the management software is characterized in that the program described above comprises a procedure for acquiring the attribute information from the peripheral equipment; and a procedure for sending a control command in accordance with the acquired attribute information, and the attribute information includes a list of types of the usable directory servers.

[0065]

Also, the management software is characterized in that the program described above comprises a procedure for acquiring the attribute information from the peripheral equipment; and a procedure for sending a control command in accordance with the acquired attribute information, and is characterized in that the attribute information includes the type of a currently used directory server.

[0066]

Further, the storage medium is characterized in that the program comprises a procedure for acquiring the attribute information from the peripheral equipment; and a procedure for sending a control command in accordance with the acquired attribute information, and the attribute information includes a list of types of the usable directory servers.

[0067]

Also, the storage medium is characterized in

that the program comprises a procedure for acquiring the attribute information from the peripheral equipment; and a procedure for sending a control command in accordance with the acquired attribute information, and the attribute information includes the type of a currently used directory server.

[0068]

Further, the peripheral equipment is characterized by having a console to be operated by a user, is connected to the directory server by using user information entering through the console, and further comprises an acquisition means for acquiring an access ticket for the pertinent peripheral equipment of the user.

[0069]

Also, the peripheral equipment is characterized by decrypting the access ticket included in a job received through the network, and by being operated in accordance with the contents of the decrypted access ticket.

[0070]

Further, the peripheral equipment is characterized in that the access ticket includes user information, and by comprising recording means for recording the number of prints printed in accordance with the user information and the job as a log.

[0071]

Also, the peripheral equipment is characterized in that the access ticket includes user information, and by comprising sending means for sending the number of prints printed in accordance with the user information and the job to the directory server connected through the network.

[0072]

Further, the peripheral equipment is characterized in that the access ticket includes the permitted maximum number of prints, and by comprising determining means for determining whether the job is to be received or not on the basis of the permitted maximum number of prints and finishing means for finishing the job when the actual number of prints exceeds the permitted maximum number of prints.

[0073]

Also, the peripheral equipment is characterized in that the access ticket includes user information and by comprising obtaining means for obtaining the permitted maximum number of prints of the concerned user retained in the directory server by using the user information immediately before the execution of a job, determining means for determining whether the job is to be received or not on the basis of the permitted maximum number of prints, and finishing means for finishing the job when the actual number of prints exceeds the permitted maximum number of prints.

[0074]

Further, the peripheral equipment is characterized in that the attribute information has a list of operation modes to be taken in the case of a failure of connecting to the directory server and a current operation mode to be taken in the case of a failure of connecting to the directory server; and by comprising acquisition setting execution means for acquiring and setting the attribute information under instruction of the information processing apparatus connected to the network.

[0075]

Also, the peripheral equipment comprises comparing means for comparing user information temporarily stored with user information received from the console, and is characterized in that an operation mode to be taken in the case of a failure of connecting to the directory server is a mode for performing an operation when the user information temporarily stored and the user information received from the console coincide.

[0076]

Further, the peripheral equipment comprises comparing means for comparing user information temporarily stored with user information received from the console, and is characterized in that an operation mode to be taken in the case of a failure of connecting

to the directory server is a mode for performing an operation within a predetermined limit period of time from normal acquisition of an access ticket when the user information temporarily stored and the user information received from the console coincide.

[0077]

Also, the peripheral equipment further comprises comparing means for comparing user information temporarily stored with user information received from the console, and is characterized in that an operation mode to be taken in the case of a failure of connecting to the directory server is a mode for performing an operation within a predetermined limit period of time from normal acquisition of an access ticket and within the maximum permitted number of prints stored in the equipment in advance when the user information temporarily stored and the user information received from the console coincide.

[0078]

Further, the peripheral equipment comprises comparing means for comparing user information temporarily stored with user information received from the console, and is characterized in that an operation mode to be taken in the case of a failure of connecting to the directory server is a mode for performing an operation within a a predetermined limit period of time from normal acquisition of an access ticket and within

the maximum permitted number of prints for the concerned user in the user information temporarily stored when the user information temporarily stored and the user information received from the console coincide.
[0079]

Also, the peripheral equipment further comprises comparing means for comparing user information temporarily stored with user information received from the console, and is characterized in that an operation mode to be taken in the case of a failure of connecting to the directory server is a mode for performing an operation within the maximum permitted number of prints stored in the equipment in advance when the user information temporarily stored and the user information received from the console coincide.
[0080]

Further, the peripheral equipment further comprises comparing means for comparing user information temporarily stored with user information received from the console, and is characterized in that an operation mode to be taken in the case of a failure of connecting to the directory server is a mode for performing an operation within the maximum permitted number of prints for the concerned user in the user information temporarily stored when the user information temporarily stored and the user information received from the console coincide.

[0081]

Also, the peripheral equipment further comprises comparing means for comparing user information temporarily stored with user information received from the console, and is characterized in that an operation mode to be taken in the case of a failure of connecting to the directory server is a mode for performing an operation within the maximum permitted number of prints for each user session stored in the equipment in advance when the user information temporarily stored and the user information received from the console coincide.

[0082]

Further, the peripheral equipment further comprises comparing means for comparing user information temporarily stored with user information received from the console, and is characterized in that an operation mode to be taken in the case of a failure of connecting to the directory server is a mode for prohibiting the use of the peripheral equipment by the user.

[0083]

Also, the maximum permitted number of prints stored in the equipment in advance is reduced in proportion to the time from the normal acquisition of an access ticket.

[0084]

Further, the management method further comprises a step of connecting to the directory server by using the user information received from the console to acquire an access ticket to the peripheral equipment of the pertinent user.

[0085]

Also, the management method further comprises a step of decrypting the access ticket included in the job received through the network so as to operate in accordance with the contents of the decrypted access ticket.

[0086]

Further, the program described above includes a procedure for connecting to the directory server by using the user information received from the console so as to obtain an access ticket to the peripheral equipment of the pertinent user.

[0087]

Also, the program described above includes a procedure for decrypting the access ticket included in the job received through the network so as to operate in accordance with the contents of the decrypted access ticket.

[0088]

Further, the program described above includes a procedure for connecting to the directory server by using the user information received from the console so

as to obtain an access ticket to the peripheral equipment of the pertinent user.

[0089]

Also, the program described above includes a procedure for decrypting the access ticket included in the job received through the network so as to operate in accordance with the contents of the decrypted access ticket.

[0090]

[Description of the Preferred Embodiments]

Embodiments of peripheral equipment, an information processing apparatus, a peripheral equipment control system, a management method, a management software and a storage medium of the present invention will be described below by referring to the drawings.

[0091]

(First Embodiment)

FIG. 1 is a block diagram showing a configuration of a peripheral equipment control system according to a first embodiment. In the drawing, reference numerals 1 and 5 denote peripheral equipment MFP(1) and an MFP(2), respectively (hereafter uniformly referred to as the MFP(1) 1 and the MFP(2) 5). In addition, reference numerals 2, 3 and 4 denote personal computers described as personal computers including a PC(1), a PC(2) and a PC(3), respectively (hereafter

uniformly referred to as the PC(1) 2, the PC(2) 3 and the PC(3) 4). The PC(1) 2, the PC(2) 3 and the PC(3) 4 are connected to the MFP(1) 1 and the MFP(2) 5 by way of a network 10 or a local interface respectively. On the PC(1) 2, the PC(2) 3 and the PC(3) 4, peripheral equipment control software related to the present invention operates and requests the MFP(1) 1 to process the jobs such as a print, a scan, a copy or a fax transmission and reception or inquire about attribute information of the MFP(1) 1 and the MFP(2) 5.

[0092]

In addition, reference numeral 6 denotes a directory server having a centralized management function of user information and device information on the network 10, and is comprised of a personal computer and so on. This directory server 6 also has a KDC (Key Distribution Server) function in a Kerberos protocol (RFC1510) and issues a TGT (Ticket Generation Ticket) ticket and an access ticket required for accessing a specified resource in compliance with regulations of the Kerberos protocol.

[0093]

Moreover, this directory server 6 is supposed to have an MFP(1) 1 and an MFP(2) 5 already registered. This data can be referred to and updated from a PC(1) 2 and a PC(2) 3 by using an LDAP protocol (RFC1777). Each piece of the user information managed in the directory

server 6 includes a user name, a password, the permitted number of prints of the user and the accumulated number of prints of the user. In addition, each piece of the device information managed in the directory server 6 includes a device name and a cryptograph key.

[0094]

FIG. 2 is a block diagram showing a configuration of the peripheral equipment (the MFP(1) 1 and the MFP(2) 5). In the diagram, reference numeral 11 denotes a controller for controlling the peripheral equipment. Reference numeral 12 denotes a communication interface for the controller 11 to communicate with the outside of the peripheral equipment, which is an Ethernet interface, an IEEE1284 interface or another communication interface for instance.

[0095]

Reference numeral 13 denotes a scanner engine and is controlled by the controller 11. Reference numeral 14 denotes a printer engine and is controlled by the controller 11, and for instance, it is a laser beam printer, an ink jet printer or another printer.

[0096]

Reference numeral 15 denotes a FAX board for implementing a FAX function of performing communication control such as sending and receiving images, and is controlled by the controller 11. Reference numeral 16

denotes a user interface comprised of an LCD display and a keyboard, and displays information from the controller 11 and communicates an instruction from the user to the controller 11.

[0097]

The peripheral equipment having such a configuration selects a printer engine 14 and allows a print job to be issued. In addition, it selects the printer engine 14 and a scanner engine 13 to allow a copy job to be issued. Moreover, it selects the printer engine 14, the scanner engine 13 and the FAX board 15 to allow a FAX reception job and a FAX transmission job to be issued.

[0098]

FIG. 3 is a block diagram showing a hardware configuration of the controller 11. The controller 11 is mutually connected via a system bus 20 with a CPU 21, a RAM 22, an LCD 23, a keyboard 24, a ROM 25, a communication interface 26, a scanner engine 27, a printer engine 28, a FAX board 29 and a disk 30.

[0099]

A program for controlling the controller 11 is stored in the ROM 25 or the disk 30, and is read by the RAM 22 as required and executed by the CPU 21. Also, the ROM 25 or the disk 30 has attribute information showing the peripheral equipment and functions and states of the jobs to be processed by the peripheral

equipment and job data to be outputted and so on stored in addition to the control program. Moreover, the CPU 21 produces a display on the LCD 23 and is instructed by the user from the keyboard 24. In addition, the CPU 21 performs communication with the outside through the interface 26.

[0100]

In the peripheral equipment (FIG. 2) according to this embodiment, unless specifically noted otherwise, the CPU 21 receives the user-input from the keyboard 24 via the system bus 20 and controls the RAM 22, the LCD 23, the ROM 25, the communication interface 26, the scanner engine 27, the printer engine 28, the FAX board 29 and the disk 30.

[0101]

FIG. 4 is a block diagram showing the hardware configuration of the PC constituting a network system. On the PC, a CPU 31, a RAM 32, a CRT 33, a keyboard 34, a pointing device 35, a ROM 36, a disk 37 and a communication interface 38 are mutually connected via a system bus 40. The program for controlling the PC is stored in the ROM 36 or the disk 37, and is read by the RAM 32 as required and executed by the CPU 31. Moreover, the CPU 31 produces a display through the CRT 33 and is instructed by the user from the keyboard 34 and the pointing device 35. In addition, the CPU 31 performs communication with the outside through the

communication interface 38.

[0102]

In the PC according to this embodiment, unless specifically noted otherwise, the CPU 31 receives the user-input from the keyboard 34 or the pointing device 35 via the system bus 40 and controls the RAM 32, the CRT 33, the ROM 36, the disk 37 and the communication interface 38. In addition, the user's instruction to the peripheral equipment and display of information to the user may be performed either through a local user interface 16 or through the device to be a client connected to the network 10 such as the PC(1) 2, the PC(2) 3 and the PC(3) 4.

[0103]

FIG. 5 is a diagram showing the attribute information held by the MFP(1) 1. While the MFP(2) 5 has the same data structure as the MFP(1) 1, values held thereby are different. Such information is held by the ROM 25, the RAM 22 and the disk 30, and the individual attribute information may be obtained or set from the PC(1) 2, the PC(2) 3 and the PC(3) 4 by the process mentioned later.

[0104]

In the diagram, 301 is a "Supported User Management Mode List" attribute, and holds a plurality of values as a list, that is, "No User Management," "Password," "User ID," "User ID and Password" and "Join

Security Domain."

[0105]

Reference numeral 302 denotes a "Current User Management Mode" attribute, and holds "Join Security Domain" as the value. Reference numeral 303 denotes an "Adaptive Directory Server Type List" attribute, and holds a plurality of values as the list, that is, "Standard LDAP Server," "Active Directory (MS)," "NDS (Novell)" and "Open LDAP."

[0106]

Reference numeral 304 denotes a "Current Directory Server Type" attribute, and holds "Active Directory (MS)" as the value. Reference numeral 305 denotes a "Current Directory Server IP Address" attribute, and holds "123. 56. 54. 21" as the value. Reference numeral 306 denotes a "Cryptograph key" attribute, and holds "0x34q4bffcda001" as the value. This value becomes effective in the case where the "Current User Management Mode" attribute is "Join Security Domain," and is used to interpret the access ticket issued from the directory server 6.

[0107]

Reference numeral 307 denotes a "Permission to Use in case of Inaccessible Directory Server" attribute, and holds "TRUE" as the value. Reference numeral 308 denotes a "Limit Types for Use in case of Inaccessible Directory Server" attribute, and holds a plurality of

values as the list, that is, "No Limit," "Time," "Time and Fixed Max No. of Prints," "Time and Max No. of Prints," "Fixed Max No. of Prints," "Max No. of Prints" and "For each Login."

[0108]

Reference numeral 309 denotes a "Current Limit Types for Use in case of Inaccessible Directory Server" attribute, and holds "Time" as the value. Reference numeral 310 denotes a "Time Limit" attribute, and holds "48 Hours" as the value. Reference numeral 311 denotes a "Daily Reduction Ratio of Max No. of Prints" attribute, and holds "30" as the value. Reference numeral 312 denotes a "Max No. of Prints" attribute, and holds "100" as the value. Reference numeral 313 denotes a "Max No. of Prints for each Login" attribute, and holds "20" as the value.

[0109]

FIG. 6 is a flowchart showing the procedure for displaying and/or changing a user management mode of the MFP(1) 1 from the PC(1) 2, the PC(2) 3 and the PC(3) 4. This processing program runs on the PC(1) 2, the PC(2) 3 and the PC(3) 4. First, it obtains attribute information 301 of the MFP(1) 1 (step S1701). This attribute information is obtained by sending an attribute acquisition command from the PC(1) 2, the PC(2) 3 and the PC(3) 4 to the MFP(1) 1 and processing this command on the MFP(1) 1. And it displays the

obtained attribute information on the CRT 33 (step S1702). Furthermore, it obtains a "Current User Management Mode" attribute 302 that is the attribute information (step S1703) and displays it on the CRT 33 (step S1704).

[0110]

It waits for the user-input (step S1705), and sets the "Current User Management Mode" attribute 302 that is the attribute information (step S1706) according to the user-input to finish the process. This attribute information is set by sending an attribute setting command from the PC(1) 2, the PC(2) 3 and the PC(3) 4 to the MFP(1) 1 and processing this command on the MFP(1) 1.

[0111]

FIG. 7 is a diagram showing a user interface screen displayed on the CRT 33 in the state of waiting for user-input in a step S1705. In the diagram, 101 indicates a list of the user management modes (attribute 301) that can be selected by the user. The attribute 302 of the currently set user management mode is in reverse video in 102 in the diagram. The user selects a desired user management mode and puts it in reverse video, and presses an OK button 103 to execute the process of the step S1706 and perform setting of the user management mode.

[0112]

Moreover, the procedure in FIG. 6 may be performed by, instead of the PCs, the controller 11 of the MFP(1) 1 itself of which user management mode is to be changed, and the display in FIG. 7 may also be performed on the user interface 16 included in the MFP. It may also be performed and/or displayed on the other MFP(2) 5.

[0113]

FIG. 8 is a flowchart showing an operating procedure for displaying and/or changing a directory server corresponding to the MFP(1) 1 from the PC(1) 2, the PC(2) 3 and the PC(3) 4. This procedure is performed on the PC(1) 2, the PC(2) 3 and the PC(3) 4.

[0114]

First, attribute information 303 is obtained (step S1801). This attribute information is obtained by sending the attribute acquisition command from the PC(1) 2, the PC(2) 3 and the PC(3) 4 to the MFP(1) 1 and processing this command on the MFP(1) 1 following the procedure mentioned later. And the obtained attribute information is displayed on the CRT 33 (step S1802).

[0115]

Furthermore, attribute information 304 is obtained (step S1803) and the obtained attribute information is displayed on the CRT 33 (step S1804). Attribute information 305 is obtained (step S1805) and

the obtained attribute information 305 is displayed on the CRT 33 (step S1806).

[0116]

The user-input is waited for (step S1807), and attribute information 304 and 305 is set according to the user-input (step S1808). This attribute information is set by sending an attribute setting command from the PC(1) 2, the PC(2) 3 and the PC(3) 4 to the MFP(1) 1 and processing this command on the MFP(1) 1 following the procedure mentioned later.

[0117]

FIG. 9 is a diagram showing the user interface screen displayed on the CRT 33 in the state of waiting for user-input in a step S1807. In the diagram, 201 indicates the list of the directory server types (attribute 303) that can be selected by the user. The currently set directory server type (attribute 304) is in reverse video in 202 in the diagram. Moreover, an IP address 305 of the currently set directory server is displayed in an address division 203. The user selects a desired directory server type and puts it in reverse video, inputs a desired IP address in the address division 203, and presses an OK button 204 to execute the process of the step S1808 and perform setting of the corresponding directory server.

[0118]

Moreover, the process shown in FIG. 8 may be

performed by, instead of the PCs, the controller 11 of the MFP(1) 1 itself of which set directory server is to be changed, and the display shown in FIG. 9 may also be performed by the user interface 16 included in the MFP. It may also be performed and/or displayed on the other MFP(2) 5.

[0119]

FIG. 10 is a flowchart showing the procedure for displaying and/or changing from the PC(1) 2, the PC(2) 3 and the PC(3) 4 how to permit a login in the case where the MFP(1) cannot be connected to the directory server 6. This procedure is performed on the PC(1) 2, the PC(2) 3 and the PC(3) 4.

[0120]

First, a "Limit Types for Use in case of Inaccessible Directory Server" attribute 308 that is the attribute information is obtained (step S2201). The attribute information is obtained by sending the attribute acquisition command from the PC(1) 2, the PC(2) 3 and the PC(3) 4 to the MFP(1) 1 and processing this command on the MFP(1) 1 following the procedure mentioned later. And the obtained attribute information is displayed on the CRT 33 (step S2202).

[0121]

A "Current Limit Type for Use in case of Inaccessible Directory Server" attribute 309 that is the attribute information is obtained (step S2203) and

the obtained attribute information is displayed on the CRT 33 (step S2204). Furthermore, a "Permission to Use in case of Inaccessible Directory Server" attribute 307 that is the attribute information is obtained (step S2205). The obtained attribute information is displayed on the CRT 33 (step S2206).

[0122]

The user-input is waited for (step S2207), and attribute information 309 and 307 is set according to the user-input (step S2208) to finish the process. The attribute information is set by sending the attribute setting command from the PC(1) 2, the PC(2) 3 and the PC(3) 4 to the MFP(1) 1 and processing this command on the MFP(1) 1 following the procedure mentioned later.

[0123]

FIG. 11 is a diagram showing the user interface . screen displayed on the CRT 33 in the state of waiting for the user-input in a step S2207. In the diagram, 2102 indicates the contents of the "Limit Types for Use in case of Inaccessible Directory Server" attribute 308, and the value of the "Current Limit Type for Use in case of Inaccessible Directory Server" attribute 309 is in reverse video in 2103 in the diagram. Moreover, the value of the "Permission to Use in case of Inaccessible Directory Server" attribute 307 is displayed in a check box 2101. The user performs a desired setting and then presses an OK button 2104 to execute the process of the

step S2208 and perform setting of the attribute information.

[0124]

Moreover, the process shown in FIG. 10 may be performed by, instead of the PCs, the controller 11 of the MFP(1) 1 itself of which setting is to be changed, and the display shown in FIG. 11 may also be performed by the user interface 16 included in the MFP.

Furthermore, it may be performed and/or displayed on the other MFP(2) 5.

[0125]

FIGS. 12 and 13 are flowcharts showing the procedure for issuing a print job, a scanner job, a fax transmission job or a copy job from the PC(1) 2, the PC(2) 3 and the PC(3) 4 to the MFP(1) 1. This procedure is performed on the PC(1) 2, the PC(2) 3 and the PC(3) 4.

[0126]

First, the "Current User Management Mode" attribute 302 that is the attribute information held by the MFP(1) 1 is obtained (step S401). It is determined whether or not the value of the attribute information 302 is "No User Management" (step S402). In the case where it is "No User Management" as a result of the determination, other information required for the job is set on the job, and then the job is issued to the MFP(1) 1 (step S403). Then the process is finished.

[0127]

On the other hand, in the case where it is "User Management" in the step S402, it is determined whether or not the value of the attribute information 302 is "Password" (step S404). In the case where it is "Password" as a result of the determination, the user interface screen prompting for the password is displayed on the CRT 33 (step S405). And in the step S403, other information required for the inputted password and the job is set on the job, and then the job is issued to the MFP(1) 1.

[0128]

On the other hand, in the case where it is not "Password" as a result of the determination in the step S404, it is determined whether or not the value of the attribute information 302 is "User ID" (step S406). In the case where it is "User ID" as a result of the determination, the user interface screen prompting for the user ID is displayed on the CRT 33 (step S407). And in the step S403, other information required for the inputted user ID and the job is set on the job, and then the job is issued to the MFP(1) 1.

[0129]

On the other hand, in the case where it is not "User ID" as a result of the determination in the step S406, it is determined whether or not the value of the attribute information 302 is "User ID and Password"

(step S408). In the case where it is "User ID and Password" as a result of the determination, the user interface screen prompting for the user ID and password is displayed on the CRT 33 (step S409). And in the step S403, other information required for the inputted user ID, password and the job is set on the job, and then the job is issued to the MFP(1) 1.

[0130]

On the other hand, in the case where it is not "User ID and Password" as a result of the determination in the step S408, it is determined whether or not the user has already logged in to a security domain managed by the directory server 6 on the PC being used (step S410). This determination is made by inquiring of an operating system of the PC being used. In the case where the user has not logged in as a result of the determination, the user interface screen prompting for the user ID and password is displayed on the CRT 33 (step S411), and the information is sent to the directory server 6 by using the Kerberos protocol so as to obtain TGT (Ticket Generation Ticket) information (step S413).

[0131]

On the other hand, in the case where the user has already logged in as a result of the determination in the step S410, the TGT used in a current session is requested of the operating system and is obtained (step

S412).

[0132]

The TGT obtained in the step S412 or S413 is used to obtain the permitted number of prints information of the user falling under the user name held by the operating system or the user name inputted in the step S411 from the directory server 6 by the Kerberos protocol and the LDAP protocol (step S414).

[0133]

It is determined thereafter whether or not the permitted number of prints is one or more (step S415), and in the case where it cannot be printed since it is less than one as a result of the determination, the user interface screen representing that the job cannot be issued is displayed on the CRT 33 (step S416) to finish the process.

[0134]

On the other hand, in the case where printing is possible with the permitted number of prints of one or more as a result of the determination in the step S415, the TGT obtained in the step S412 or S413 and a parameter of an identifier identifying the MFP(1) 1 of the job issue destination are sent to the directory server 6 by the Kerberos protocol to obtain the access ticket for the MFP(1) 1 (step S417). The access ticket obtained here has the information on the user name, the user ID, the user's permitted number of prints and its

expiration date that is encrypted by cryptograph key attribute information 306 of the MFP(1) 1. A data format in the access ticket and encryption (algorithm) to be used are uniquely determined in advance according to the currently corresponding directory server type (attribute information 304).

[0135]

And the access ticket obtained in the step S417 and the other information required for the job are set on the job, and then the job is issued to the MFP(1) 1 (step S418) to finish the process.

[0136]

FIG. 14 is a flowchart showing the procedure for issuing the job in the step S403. First, the parameter of the attribute setting command for the attribute required for the job is set (step S502). This parameter is comprised of an attribute name of a setting subject and the value therefor. The attribute setting command created in the step S502 is sent to the MFP(1) 1 (step S503). It is determined whether or not the setting of the required job attribute is completed (step S504), and in the case where it is not completed, the process in the step S502 is repeated.

[0137]

On the other hand, in the case where the setting of the required job attribute is completed in the step S504, target data of job processing such as image data

created by an application and so on is sent to this MFP by a job data transmission command (step S505). A job submitting completion notice command showing completion of sending the job submitting command is sent (step S506) to finish the process.

[0138]

FIGS. 15 and 16 are flowcharts showing the procedure for receiving a job submitting command when the MFP(1) 1 receives the job issued by the process in FIG. 14. This process is performed by the MFP(1) 1 each time the command constituting the job is received.

[0139]

The received command and its parameter are analyzed (step S601). As a result of this analysis, it is determined whether or not the received command is the attribute setting command (step S602). In the case where the received command is the attribute setting command, it is determined whether or not the attribute can be interpreted by the MFP(1) 1 (step S603).

[0140]

In the case where it can be interpreted, a pair of the specified attribute name and attribute value is stored as the job data on the RAM 22 or the disk 30 according to the analysis results obtained in the step S601 (step S604) to finish the process. On the other hand, in the case where it cannot be interpreted in the step S603, it is impossible to set the attribute

specified by the received attribute setting command, and so it is communicated in reply that the attribute could not be set (step S616) to finish the process.

[0141]

On the other hand, in the case where the received command is not the attribute setting command in the step S602, it is determined whether or not the received command is the job data transmission command from the analysis results obtained in the step S601 (step S611). In the case where it is the job data transmission command, the job data received following the command is stored in the RAM 22 or the disk 30 (step S612) to finish the process.

[0142]

On the other hand, in the case where it is not the job data transmission command in the step S611, it is determined whether or not the received command is a job submitting termination notice command from the analysis results obtained in the step S601 (step S613). In the case where it is the job submitting termination notice command, processing of the job data held in the RAM 22 or the disk 30 is started (step S614). On the other hand, in the case where it is not the job submitting termination notice command, the received command is another command, and a process depending on the other command is performed (step S615) to finish the process.

[0143]

FIG. 17 is a diagram showing the data structure of the job held in the MFP(1) 1 as a result of the process in FIGS. 15 and 16. This job is comprised of an attribute list 701 representing the function and attribute of the job and job data 702 representing the data to be the processing target of the job. The job data 702 is not necessary depending on the job type. The attribute list 701 is the list of a pair of an attribute name 711 and an attribute value 712 corresponding thereto.

[0144]

In the diagram, reference numeral 721 represents that the job is the printing job. Reference numeral 722 represents that the job starting mode is pending. Reference numeral 723 represents that the user management mode is "Join Security Domain" and indicates that an access ticket 726 is used as the user information on the job. Reference numeral 724 denotes the attribute for which the user ID is set in the case where the user management mode is "User ID" or "User ID and Password." Reference numeral 725 denotes the attribute for which the password is set in the case where the user management mode is "Password" or "User ID and Password." Reference numeral 726 denotes the attribute for which the access ticket is set in the case where the user management mode is "Join Security

Domain." Moreover, as for the attributes 724, 725 and 726, only what is necessary may be set as the job data according to the contents of the attribute 723.

[0145]

FIGS. 18 and 19 are flowcharts showing the procedure of the job data held in the MFP(1) 1 shown in FIG. 17. This procedure is performed on the MFP(1) 1. First, the attribute information (current user management mode) 302 is obtained (step S801). It is determined whether or not the value of the attribute information 302 is "No User Management" (step S802).

[0146]

In the case of "No User Management" as a result of the determination, the processing of the attributes except the attributes 723, 724, 725 and 726 is performed (step S803), and job data processing is performed based on these attributes (step S810). The job processing results are logged (step S811) to finish the process. This log is stored in the RAM 22 or the disk 30.

[0147]

On the other hand, in the case where there is the user management as a result of the determination in the step S802, it is determined whether or not the value of the attribute information 302 is "Password" (step S804). In the case where it is "Password" as a result of the determination, a password value held in

advance in the RAM 22 or the disk 30 is compared to attribute information 725 (step S805), and in the case where they coincide, the job processing is continued in the step S803. On the other hand, in the case where they do not coincide, the job processing is aborted.

[0148]

On the other hand, in the case where it is not "Password" as a result of the determination in the step S804, it is determined whether or not the value of the attribute information 302 is "User ID" (step S806). In the case where it is "User ID" as a result of the determination, a user ID value held in advance in the RAM 22 or the disk 30 is compared to attribute information 724 (step S807), and in the case where they coincide, the job processing is continued in the step S803. On the other hand, in the case where they do not coincide, the job processing is aborted.

[0149]

In the case where it is not "User ID" as a result of the determination in the step S806, it is determined whether or not the value of the attribute information 302 is "User ID and Password" (step S808). In the case where it is "User ID and Password" as a result of the determination, the user ID value and the password value held in advance in the RAM 22 or the disk 30 is compared to attribute information 724 and 725 respectively (step S809), and in the case where

they coincide, the job processing is continued in the step S803. In the case where they do not coincide, the job processing is aborted.

[0150]

On the other hand, in the case where it is not "User ID and Password" as a result of the determination in the step S808, the access ticket value 726 is decrypted by using the cryptograph key that is the attribute information 306 (step S812). And it is determined whether or not the access ticket is valid (step S813). In the case where the access ticket value could not be decrypted or the value of the permitted number of prints held in the access ticket is 0, it is determined that the access ticket is invalid in the step S813, and the job data is abandoned (step S814) to finish the process.

[0151]

On the other hand, in the case where it is determined that the access ticket is valid in the step S813, the permitted number of prints information of the user falling under the user ID in the access ticket is obtained from the directory server 6 by the Kerberos protocol and the LDAP protocol (step S815).

[0152]

It is determined whether or not it can be printed with the permitted number of prints of one or more (step S816), and in the case where it cannot be

printed, the job data is abandoned (step S817) to finish the process. On the other hand, in the case where it can be printed as a result of the determination in the step S816, the processing of the attributes except the attributes 723, 724, 725 and 726 is performed (step S818), and job data processing is performed based on these attributes (step S819). Moreover, this processing is monitored so that the permitted number of prints obtained from the process in the step S815 is not exceeded, and in the case where the maximum number of prints is exceeded, it causes the job data processing to abnormally end. Whether the job normally ends or abnormally ends, the job processing results are logged (step S820) to finish the process. The user ID and the number of prints printed by the job are logged, which is stored in the RAM 22 or the disk 30.

[0153]

Moreover, while the job data is once constructed in the MFP(1) 1 in the process in FIGS. 15 and 16 and then it is processed again in the process in FIGS. 18 and 19 in this embodiment, it is also feasible, as another embodiment, to unite the process in FIGS. 15 and 16 with the process in FIGS. 18 and 19, thus simultaneously performing a job analysis and the job processing.

[0154]

In addition, while the permitted number of prints in the access ticket is determined in the step S813, and the permitted number of prints of the user held in the directory server 6 is determined in the steps S815 and S816 in this embodiment, it is also feasible, as another embodiment, to omit either the determination of the permitted number of prints in the access ticket in the step S813 or the determination of the permitted number of prints of the user held in the directory server 6 in the steps S815 and S816.

[0155]

In addition, while the job results are held as logs in the MFP(1) 1 in the step S820 in this embodiment, it is also feasible to update the permitted number of prints and the accumulated number of prints of the user held in the directory server 6 by the number of prints printed by the job. The permitted number of prints is updated by obtaining the permitted number of prints and the accumulated number of prints indicated by the user ID held in the directory server 6 by the LDAP protocol, subtracting the number of prints printed by the job from the permitted number of prints, and further adding the number of prints printed by the job to the accumulated number of prints, and then setting these obtained values in the directory server 6 by the LDAP protocol.

[0156]

FIGS. 20 and 21 are flowcharts showing the procedure of the login screen displayed on an LCD 23 of the MFP(1) 1. This process is performed on the MFP(1) 1. First, the attribute information 302 (current user management mode) is obtained (step S901). It is determined whether or not the value of the attribute information 302 is "No User Management" (step S902).
[0157]

In the case where it is "No User Management" as a result of the determination, the login information is stored in the RAM 22 (step S903). The login information holds the user management mode, the user ID and the permitted number of prints as of logging in. The permitted number of prints is sequentially updated by the number of prints used in the jobs accompanying printing such as a print job and a copy job issued from the console within a login period, and the job is finished when the value of the permitted number of prints becomes 0. In the step S903, the permitted number of prints is set at infinity. The user ID in the login information is logged together with the number of prints used in the job. After the process of the step S903, a print pending job is processed (step S924) to finish the process.

[0158]

On the other hand, in the case where there is the user management as a result of the determination in

the step S902, it is determined whether or not the value of the attribute information 302 is "Password" (step S904). In the case where there is the password as a result of the determination, the user interface screen prompting for the password is displayed on the LCD 23 and the inputted password is compared to the password value held in advance in the RAM 22 or the disk 30 (step S905), and in the case where they coincide, the login processing is continued in the step S903. In the case where they do not coincide, the processing is aborted as no login allowed.

[0159]

On the other hand, in the case where there is no password as a result of the determination in the step S904, it is determined whether or not the value of the attribute information 302 is "User ID" (step S906). In the case where it is "User ID," the user interface screen prompting for the user ID is displayed on the LCD 23 and the inputted user ID is compared to the user ID value held in advance in the RAM 22 or the disk 30 (step S907), and in the case where they coincide, the login processing is continued in the step S903. In the case where they do not coincide, the processing is aborted as no login allowed.

[0160]

On the other hand, in the case where it is not the user ID as a result of the determination in the

step S906, it is determined whether or not the value of the attribute information 302 is "User ID and Password" (step S908). In the case where it is "User ID and Password" as a result of the determination, the user interface screen prompting for the user ID and the password is displayed on the LCD 23 and the inputted user ID and password are compared to the user ID value and the password value held in advance in the RAM 22 or the disk 30 (step S909), and in the case where they coincide, the login processing is continued in the step S903. In the case where they do not coincide, the processing is aborted as no login allowed.

[0161]

In the case where it is not "User ID and Password" as a result of the determination in the step S908, an attempt is made to access the directory server shown in the attribute information 305 so as to determine whether or not it is connectable (step S910).

[0162]

In the case where it is accessible, the user interface screen prompting for the user ID and the password is displayed on the LCD 23 (step S912), and the inputted user ID and password are used to obtain the access ticket from the directory server 6 by the Kerberos protocol (step S914).

[0163]

On the other hand, in the case where an error is

sent in reply from the directory server 6 to the effect that the user name or the password is invalid, such as a case of incorrect user name or password, the user interface screen prompting for the user ID and the password is displayed again in the step S912.

[0164]

And the access ticket obtained from the directory server is decrypted by using a cryptograph key 306 (step S915). Validity of the access ticket is determined (step S916). This determination is made by checking whether the ticket is within its expiration date and whether the permitted number of prints is one or more. In the case where the access ticket is not valid as a result of the determination in the step S916, the user interface screen representing that the devices may not be used with this user name is displayed on the LCD 23 (step S917) to finish the process.

[0165]

On the other hand, in the case where the access ticket is valid as a result of the determination in the step S916, the login information is stored and the user cache information is updated (step S925). Of the login information, the number of prints held by the access ticket is set as the permitted number of prints.

[0166]

FIG. 22 is a diagram showing the data structure of the user information cache. This user information

cache is held in the RAM 22 or the disk 30. The user information cache is updated by adding the user name and the password used when obtaining the access ticket, the user ID and the permitted number of prints in the access ticket, and a login time as the data. In the case where the same user name already exists in the user information cache, the existing information is updated. And then, after the process of the step S925, a print pending job is processed (step S922) to finish the process.

[0167]

On the other hand, in the case where it is impossible to access the directory server 6 in the step S910, the attribute information (Permission to Use in case of Inaccessible Directory Server) 307 is obtained to determine whether or not it is available even if the server cannot be connected (step S911). In the case where permission to use is not given, the user interface screen representing that a login is not permitted currently is displayed on the LCD 23 (step S920) to finish the process.

[0168]

On the other hand, in the case where permission to use is not given in the step S911, the user interface screen prompting for the user name and the password is displayed on the LCD 23 (step S918), and it is determined whether or not the inputted pair of the

user name and the password exists in the user information cache held by the RAM 22 or the disk 30 (step S919). In the case where it does not exist in the user information cache as a result of this determination, the user interface screen representing that the devices may not be used with this user name currently is displayed on the LCD 23 (step S921) to finish the process.

[0169]

On the other hand, in the case where the pair of the user name and the password exists in the user information cache as a result of the determination in the step S919, the permitted number of prints is computed by the process mentioned later, and this value and the user ID are stored as the login information (step S923). In addition, the value of "Join Security Domain (Inaccessible Directory Server)" is set in the user management mode in the login information. After the process of the step S923, a print pending job is processed (step S922) to finish the process.

[0170]

The login information stored in this login process is used in order to limit and record operation in issuing jobs in a login session. To be more specific, in the case where the printing is performed exceeding the permitted number of prints in the login information, the job is aborted. In addition, the number of prints

printed in the job is subtracted from the permitted number of prints in the login information.

[0171]

Furthermore, in the case where the user management mode in the login information is "Join Security Domain (Inaccessible Directory Server)," the value is updated by subtracting the number of prints printed in the job from the value of the maximum number of prints 312 or the permitted number of prints of the user information cache 1013 in accordance with the contents of "Limit Types for Use in case of Inaccessible Directory Server" 308 that is the attribute information held in the devices. The user ID in the login information is logged together with the number of prints printed in the job issued in the login session. And the login information is abandoned when the user logs off.

[0172]

Moreover, even in the case where it is possible to connect to the directory server in this embodiment, the login information holds the permitted number of prints as of logging in in the step S925 and the permitted number of prints is only updated by the job issued from the console within the login period. In the case where it is possible to connect to the directory server, however, it is also feasible to obtain the permitted number of prints of the user held by the

directory server immediately before the job is issued and limit the permitted number of prints thereby. In this case, the TGT is included in the login information held in the step S925 and the permitted number of prints of the user held by the directory server 6 immediately before the job is issued is thereby obtained by the Kerberos protocol and the LDAP protocol.

[0173]

The data of the user information cache to be updated in the process of FIGS. 20 and 21 is held in the RAM 22 or the disk 30 as aforementioned. The data is represented as a set of one record in one line, and one record is comprised of a user name 1010, a password 1011, a user 1012, a permitted number of prints 1013 and a login time 1014.

[0174]

FIG. 23 is a flowchart showing the procedure of the print pending job in the steps S924 and S922. This process is performed on the MFP(1) 1. First, a list of the jobs of which execution of printing is pending in the MFP(1) 1 is obtained (step S1101).

[0175]

The user ID in the login information held in FIGS. 20 and 21 is compared to the user ID including as the attributes the jobs obtained in the step S1101 so as to create the list of the jobs in which both of them correspond (step S1102). The user IDs of the jobs

compared here are obtained and used by decrypting the access ticket in the case where the access ticket 726 exists in the job, and if not, a user ID 724 included in the job is used.

[0176]

As a result of the process in the step S1102, it is determined whether or not the list is blank (step S1103), and the process is finished in the case where it is not blank as a result of the determination.

[0177]

On the other hand, in the case where it is blank in the step S1103, the list of the jobs in which the user IDs correspond is displayed as the user interface screen on the LCD 23 (step S1104). FIG. 24 is a diagram showing the user interface screen displayed on an LCD 23 in the step S1104. In the diagram, 1202 indicates the list of the jobs created in the step S1102. 1203 is the OK button for having the job executed, and 1204 is a cancel button for closing the user interface screen without having the job executed.

[0178]

And it is determined which of the OK button 1203 and the cancel button 1204 was pushed (step S1105), and in the case where the cancel button was pushed, it is terminated by closing the user interface screen. On the other hand, in the case where the OK button was pushed, the jobs in the list of the jobs created in the step

S1102 are executed (step S1106) to finish the process.

[0179]

FIGS. 25 and 26 are flowcharts showing the procedure when the MFP(1) 1 receives an access command for obtaining or setting individual attribute information from the PC(1) 2, the PC(2) 3 and the PC(3) 4. First, the received command and its parameter are analyzed (step S1301).

[0180]

It is determined whether or not the received command is an attribute acquirement command from the analysis results (step S1302). In the case where it is the attribute acquirement command, it is determined whether or not the attribute specified by the attribute acquirement command can be acquired (step S1303). In the case where it can be acquired, the value of the attribute held in the MFP is obtained (step S1304), and the obtained attribute value is set as the parameter of a send reply command, and the send reply command to the attribute acquirement command is sent to driver software (step S1305) to finish the process.

[0181]

On the other hand, in the case where the attribute cannot be acquired in the step S1303, a notice that the attribute acquirement failed is sent to the driver software (step S1317) to finish the process.

[0182]

On the other hand, in the case where it is not the attribute acquirement command in the step S1302, it is determined whether or not the received command is an attribute value change command from the analysis results in the step 1301 (step S1311). In the case where it is the attribute value change command, it is determined whether or not the attribute specified by the attribute value change command can be changed (step S1312).

[0183]

In the case where it can be changed, the specified attribute is changed to the specified attribute value according to a specified command parameter (step S1313), and the notice that the attribute value was successfully changed is sent to the driver software (step S1314) to finish the process. On the other hand, in the case where it cannot be changed, the notice that the attribute value change failed is sent to the driver software (step S1315) to finish the process. On the other hand, in the case where it is not the attribute value change command in the step S1311, the received command is another command, and so the process depending on the other command is performed (step S1316) to finish the process.

[0184]

FIGS. 27 and 28 are flowcharts showing the procedure for issuing a management command such as

device management or job management from the PC(1) 2, the PC(2) 3 and the PC(3) 4 to the MFP(1) 1. This process is performed on the PC(2) 3 and the PC(3) 4. First, the attribute information (current user management mode) 302 held by the MFP(1) 1 is obtained (step S1401).

[0185]

It is determined whether or not the value of the attribute information 302 is "No User Management" (step S1402). In the case where it is "No User Management" as a result of the determination, the management command shown in FIG. 29 is generated and sent to the MFP(1) 1 (step S1403). FIG. 29 is a diagram showing the data structure of the management command. In the diagram, reference numeral 1501 represents the user management mode and indicates which information of a user ID 1502, a password 1503 and an access ticket 1504 is valid. In addition, reference numeral 1505 represents a command type. Moreover, reference numeral 1506 represents a length of a parameter 1507 required for the command.

[0186]

The MFP(1) 1 processes the received management command according to the procedure shown in FIGS. 30 and 31, and transmits the results. The reply sent from the MFP(1) 1 is processed (step S1417). This process is different depending of the process of the management command sent in the step S1403, and especially in the

case where the management command is "ListJobs" that is a command for obtaining the list of the jobs of which management command is held in the MFP, the list of the jobs included in the reply is displayed as the user interface screen on the CRT 33. This process is finished thereafter.

[0187]

On the other hand, in the case where there is the user management as a result of the determination in the step S1402, it is determined whether or not the value of the attribute information 302 is "Password" (step S1404). In the case where it is "Password" as a result of the determination, the user interface screen prompting for the password is displayed on the CRT 33 (step S1405). And the management command setting the inputted password is generated and is sent to the MFP(1) 1 in the step S1403.

[0188]

On the other hand, in the case where there is no password as a result of the determination in the step S1404, it is determined whether or not the value of the attribute information 302 is "User ID" (step S1406). In the case where it is "User ID" as a result of the determination, the user interface screen prompting for the user ID is displayed on the CRT 33 (step S1407). And the management command setting the inputted user ID is generated and is sent to the MFP(1) 1 in the step

S1403.

[0189]

On the other hand, in the case where it is not "User ID" as a result of the determination in the step S1406, it is determined whether or not the value of the attribute information 302 is "User ID and Password" (step S1408). In the case where it is "User ID and Password" as a result of the determination, the user interface screen prompting for the user ID and the password is displayed on the CRT 33 (step S1409). And the management command setting the inputted user ID and the password is generated and is sent to the MFP(1) 1 in the step S1403.

[0190]

On the other hand, in the case where it is not "User ID and Password" as a result of the determination in the step S1408, it is determined on the PC being used whether or not the user has already logged in to the security domain managed by the directory server 6 (step S1410). This determination is made by inquiring of an operating system of the PC being used.

[0191]

In the case where the user has not logged in as a result of the determination, the user interface screen prompting for the user ID and password is displayed on the CRT 33 (step S1411), and the information is sent to the directory server 6 by using

the Kerberos protocol so as to obtain the TGT (Ticket Generation Ticket) information (step S1413).

[0192]

On the other hand, in the case where the user has already logged in as a result of the determination in the step S1410, the TGT used in the current session is requested of the operating system and is obtained since the user has already logged in (step S1412).

[0193]

The TGT obtained in the step S1412 or S1413 and the identifier (parameter) identifying the MFP(1) 1 of the job issue destination are sent to the directory server 6 by the Kerberos protocol to obtain the access ticket for the MFP(1) 1 (step S1414). The access ticket obtained here has the information on the user name, the user ID, the user's permitted number of prints and its expiration date encrypted by cryptograph key 306 of the MFP(1) 1. The data format in the access ticket and the encryption (algorithm) to be used are uniquely determined in advance according to the currently corresponding directory server type 304.

[0194]

The management command setting the access ticket obtained in the step S1414 is generated and is sent to the MFP(1) 1 (step S1415). The same reply process as in the step S1417 is performed thereafter (step S1416). The process is finished thereafter.

[0195]

FIGS. 30 and 31 are flowcharts showing the procedure for MFP(1) to process the management command generated by the process in FIGS. 27 and 28 and then sent to the MFP(1) 1. This process is performed on the MFP(1) 1.

[0196]

First, the attribute information (current user management mode) 302 is obtained (step S1601). It is determined whether or not the value of the attribute information 302 is "No User Management" (step S1602). In the case of "No User Management" as a result of the determination, the value 0 is set on the user ID 1502 in the management command (step S1603), and processing is performed according to the command types from the step S1613 onward.

[0197]

On the other hand, in the case where there is the user management as a result of the determination in the step S1602, it is determined whether or not the value of the attribute information 302 is "Password" (step S1604). In the case where it is "Password" as a result of the determination, the password value held in advance in the RAM 22 or the disk 30 is compared to the password 1503, and in the case where they coincide, the value 0 is set on the user ID 1502 in the management command (step S1605). Hereafter, processing is

performed according to the command types from the step S1613 onward. In the case where they do not coincide, the error is returned and the management command processing is aborted.

[0198]

On the other hand, in the case where it is not "Password" as a result of the determination in the step S1604, it is determined whether or not the value of the attribute information 302 is "User ID" (step S1606). In the case where it is "User ID" as a result of the determination, the user ID value held in advance in the RAM 22 or the disk 30 is compared to the user ID 1502 (step S1607). In the case where they coincide, processing is performed according to the command types from the step S1613 onward. In the case where they do not coincide, the error is returned and the management command processing is aborted.

[0199]

In the case where it is not "User ID" as a result of the determination in the step S1606, it is determined whether or not the value of the attribute information 302 is "User ID and Password" (step S1608). In the case where it is "User ID and Password" as a result of the determination, the user ID value and the password value held in advance in the RAM 22 or the disk 30 are compared to the user ID 1502 and the password 1503 respectively (step S1607), and in the

case where they coincide, processing is performed according to the command types from the step S1613 onward. In the case where they do not coincide, the error is returned and the management command processing is aborted.

[0200]

On the other hand, in the case where it is not "User ID and Password" in the step S1608, the value of the access ticket 1504 is decrypted by using the cryptograph key 306 (step S1610). The validity and the expiration date of the access ticket are determined as a result of the decryption (step S1611), and in the case where the access ticket is valid as a result of the determination, the user ID in the access ticket is set as the user ID 1502 in the management command, and processing is performed according to the command types from the step S1613 onward. On the other hand, in the case where the access ticket is invalid as a result of the determination in the step S1611, the error is returned (step S1612), and the management command processing is finished.

[0201]

In the process from the step S1613 onward, it is determined whether or not the command type 1505 is "ListJobs" (to obtain the list of the jobs) (step S1613). In the case where the command type 1505 is "ListJobs" as a result of the determination, the list

of the jobs held in the MFP(1) 1 is obtained (step S1614). At this time, if "Current User Management Mode" 302 is "Join Security Domain," the access ticket 726 of each job is decrypted with the cryptograph key 306 and the obtained user ID is set as the user ID 724 of the job.

[0202]

And the user ID 724 of the job obtained in the step S1614 is compared to the user ID 1502 included in the management command, so that the job name of the job wherein they do not correspond is converted into a blank (step S1615). On the other hand, the job name of the job wherein they correspond is not converted into a blank. The job list obtained in the step S1615 is returned (step S1616) and the process is finished.

[0203]

On the other hand, it is determined whether or not the command type 1505 is "CancelJob" (to cancel a specified job) as a result of the determination in the step S1613 (step S1617). In the case where the command type 1505 is not "CancelJob" as a result of the determination, the device management command is processed (step S1619) to finish the process. In the processing of the device management command in the step S1619, a plurality of device management commands may be processed by dividing them into cases by using the command type 1505.

[0204]

As a result of the determination in the step S1617, the information on the specified job is obtained (step S1618). In the case where "Current User Management Mode" 302 is "Join Security Domain" at this time, the access ticket 726 of the job is decrypted with the cryptograph key 306 and the obtained user ID is set as the user ID 724 of the job.

[0205]

And the user ID 724 of the job is compared to the user ID 1502 included in the management command (step S1620), and in the case where they do not correspond, it is replied that the execution of the management command failed (step S1623) to finish the process. On the other hand, in the case where they correspond in the step S1620, the specified job is cancelled (step S1621), and it is replied that the execution of the management command was successful (step S1622) to finish the process.

[0206]

Moreover, it is possible, by changing the process in the step S1621, to have the job management other than a job cancel to which a job access control function is added (a temporary halt, a restart, an interruption, higher priority and lower priority of the job, for instance) performed.

[0207]

FIG. 32 is a flowchart showing the procedure for totaling the logs of the MFP(1) 1 and the MFP(2) 5 and updating the permitted number of prints and the number of accumulated prints for each user of the directory server 6. This process is performed on the directory server 6. First, the logs are obtained from the subject MFPs (step S1901).

[0208]

The number of prints printed for each user ID is totaled from the log information (step S1902). The permitted number of prints and the accumulated number of prints of each user are obtained from the directory server 6 by the LDAP protocol, and the obtained number of prints is subtracted from the permitted number of prints, and is further added to the accumulated number of prints, and then the obtained results are set in the directory server 6 by the LDAP protocol (step S1903). Thus, the permitted number of prints and the accumulated number of prints for each user in the directory server 6 are updated.

[0209]

Thus, the process in FIG. 32 is performed to the MFP(1) 1 and the MFP(2) 5 so that the permitted number of prints and the accumulated number of prints for the two MFPs are centrally managed by the directory server 6.

[0210]

Moreover, as another embodiment, in the case where the data of the directory server 6 is updated by connecting to the directory server 6 each time the job is finished without logging the number of prints used in the job, it is not necessary to perform the process in FIG. 32.

[0211]

FIGS. 33 and 34 are flowcharts showing a computing procedure for computing the permitted number of prints when it is impossible to connect to the directory server in the step S923 in FIGS. 20 and 21. This process is performed on the MFP(1) 1. First, Current Limit Type for Use in case of Inaccessible Directory Server 309 is obtained (step S2001).

[0212]

It is determined whether or not the limit type 309 is "No Limit" (step S2002). In the case where it is no limit as a result of the determination, the permitted number of prints is set as infinity (step S2003) to finish the process. On the other hand, in the case where it is not no limit as a result of the determination in the step S2002, it is determined which of "Time," "Time and Fixed Max No. of Prints," or "Time and Max No. of Prints" the limit type 309 is (step S2004). In the case it falls under one of them as a result of the determination, the user's final login time 1014 in the user information cache is obtained

(step S2005), and it is determined whether the time difference between this time and the current time is the value specified by the time limit length 310 or less (step S2006).

[0213]

In the case where it is the specified value or less, the permitted number of prints is set at 0 (step S2007) to finish the process. On the other hand, in the case where it is not any of "Time," "Time and Fixed Max No. of Prints," or "Time and Max No. of Prints" or in the case where it is within the time limit in the step S2006 as a result of the determination in the step S2004, it is determined which of "Fixed Max No. of Prints," or "Time and Fixed Max No. of Prints" the limit type 309 is (step S2008).

[0214]

In the case where it is either "Fixed Max No. of Prints," or "Time and Fixed Max No. of Prints," the value of the maximum number of prints 312 is set as the permitted number of prints (step S2010) to finish the process. On the other hand, in the case where it is neither "Fixed Max No. of Prints," nor "Time and Fixed Max No. of Prints," as a result of the determination in the step S2008, it is determined which of "Max No. of Prints," or "Time and Max No. of Prints" the limit type 309 is (step S2009). In the case where it is either "Max No. of Prints," or "Time and Max No. of Prints,"

the number of prints is calculated by the following equation (1) so as to set it as the permitted number of prints (step S2011) to finish the process.

[0215]

$$\text{Permitted No. of Prints} = \frac{\text{Permitted No. of Prints in User Information Cache} \times \text{Reduction Rate of Max No. of Prints per Day} \times \text{Time (Days) from Final Login}}{\dots (1)}$$

Here, the Time (Days) from Final Login is calculated by subtracting the current time from the user information cache login time 1014, dividing that time by the value 24 and dropping the fractional portion.

[0216]

On the other hand, in the case where it is neither "Max No. of Prints," nor "Time and Max No. of Prints," as a result of the determination in the step S2009, Max No. of Prints for each Login 313 is set as the permitted number of prints (step S2012) to finish the process.

[0217]

Moreover, while "Supported User Management Modes," "Adaptive Directory Server Types," and "Limit Types for Use in case of Inaccessible Directory Server" are obtained by the PC(1) 2, the PC(2) 3 and the PC(3) 4 directly from the MFP(1) 1 according to the procedures shown in the flowcharts in FIGS. 6, 8 and 10

respectively in this embodiment, it is also feasible, as another embodiment, to obtain "Supported User Management Modes," "Adaptive Directory Server Types," and "Limit Types for Use in case of Inaccessible Directory Server" from the MFP(1) 1 and hold them as the device information in the directory server 6 once so that the PC(1) 2, the PC(2) 3 and the PC(3) 4 will obtain them from the directory server 6.

[0218]

(Second Embodiment)

While the access ticket is included in the management command in FIG. 29 in the above described first embodiment, a data size of the access ticket is generally larger than other data sizes of the management commands, which may result in a problem in performance and so on. A peripheral equipment control system to solve this problem will be described as the second embodiment below.

[0219]

FIG. 35 is a diagram showing the data structure of the management command generated by a management command generation process mentioned later and sent to the MFP(1). In the diagram, reference numeral 2301 denotes the user management mode and indicates which information of a user ID 2302, a password 2303 and a session key 2304 is valid.

[0220]

The session key 2304 is issued by the MFP(1) 1 and is associated with the access ticket one to one by an access ticket cache in the MFP(1) 1. In the diagram, reference numeral 2305 denotes the command type. Reference numeral 2306 denotes the length of a parameter 2307 required for the command.

[0221]

FIG. 36 is a diagram showing the data structure of the access ticket cache held in the RAM 22 by the process of the access ticket setting command mentioned later. The access ticket cache is comprised of a plurality of records, wherein one record is a pair of a session key 2401 and an access ticket 2402. The access ticket held here is one after decryption by using the cryptograph key 306.

[0222]

FIGS. 37 and 38 are flowcharts showing the procedure for MFP(1) to process the management command generated by a management command generation process mentioned later and sent to the MFP(1). This procedure is performed on the MFP(1) 1. As the step processing up to the step S1608 in FIGS. 30 and 31 are the same in this procedure, that step processing is omitted, and the case where the determination process in the step S1608 is NO (false), that is, the case where the user management mode is "Join Security Domain" will be described first.

[0223]

First, it is determined whether or not the session key 2304 has the value 0 (step S2501). In the case where the session key 2304 has the value 0 as a result of the determination in the step S2501, it is determined whether or not the management command type 2305 is the "access ticket setting command" (step S2502). In the case where it is not the "access ticket setting command," the error is returned (step S2507) to finish the process.

[0224]

On the other hand, in the case where it is the "access ticket setting command" as a result of the determination in the step S2502, the value of the access ticket included in the management command parameter 2307 is decrypted by using the cryptograph key 306 (step S2519). As a result of the decryption, the validity and the expiration date of the access ticket are determined (step S2520).

[0225]

In the case where the access ticket is not valid, the error is returned (step S2521) to finish the processing of the management command. On the other hand, in the case where the access ticket is valid as a result of the determination in the step S2520, the session key corresponding to the access ticket one to one is generated, and the contents of the decrypted

access ticket are stored in the access ticket cache together with the session key (step S2503). The generated session key is returned (step S2504) to finish the process.

[0226]

On the other hand, in the case where the session key has any value other than 0 in the step S2501, the session key is searched for in the access ticket cache (step S2505), and it is determined whether or not the session key exists (step S2506). As a result of the determination, the error is returned (step S2507) to finish the process.

[0227]

On the other hand, in the case where the session key exists as a result of the determination in the step S2506, the access ticket corresponding to the session key is obtained from the access ticket cache, and the user ID in the access ticket is set as the user ID 2302 in the management command (step S2522) and processing is performed according to the command type from the step S2508 onward.

[0228]

In the process from the step S2508 onward, it is determined whether or not the command type 2305 is "ListJobs" (to obtain the list of the jobs) (step S2508). In the case where the command type 2305 is "ListJobs" as a result of the determination, the list

of the jobs held in the MFP(1) 1 is obtained (step S2509). At this time, if "Current User Management Mode" 302 is "Join Security Domain," the access ticket 726 of each job is decrypted with the cryptograph key 306 and the obtained user ID is set as the user ID 724 of the job.

[0229]

The user ID 724 of the job obtained in the step S2509 is compared to the user ID 2302 included in the management command, so that the job name of the job wherein they do not correspond is converted into a blank (step S2510). The obtained job list is returned (step S2511) to finish the process.

[0230]

On the other hand, it is determined whether or not the command type 1505 is "CancelJob" (to cancel a specified job) as a result of the determination in the step S2508 (step S2512). In the case where the command type 2305 is not "CancelJob," the device management command is processed (step S2517) to finish the process. In the processing of the device management command in the step S2517, a plurality of device management commands may be processed by dividing them into cases by using the command type 2305.

[0231]

On the other hand, in the case where the command type 1505 is "CancelJob" as a result of the

determination in the step S2512, the information of the specified job is obtained (step S2513). At this time, if "Current User Management Mode" 302 is "Join Security Domain," the access ticket 726 of the job is decrypted with the cryptograph key 306 and the obtained user ID is set as the user ID 724 of the job.

[0232]

And the user ID 724 of the job is compared to the user ID 2302 included in the management command (step S2514), and in the case where they do not correspond, it is replied that the execution of the management command failed (step S2518) to finish the process.

[0233]

On the other hand, in the case where they correspond in the step S2514, the specified job is cancelled (step S2515), and it is replied that the execution of the management command was successful (step S2516) to finish the process.

[0234]

Moreover, it is also possible, by applying the management command procedure shown in FIGS. 37 and 38 when processing the job, to have the session key included in the job instead of having the access ticket included in the job as shown in FIGS. 17, 18 and 19.

[0235]

FIG. 39 is a flowchart showing the procedure for

issuing the management command such as the device management or the job management from the PC(1) 2, the PC(2) 3 and the PC(3) 4 to the MFP(1) 1 performing the process in FIGS. 37 and 38. This procedure is performed on the PC(1) 2, the PC(2) 3 and the PC(3) 4. As this procedure is the same up to the steps S1412 and S1413 in FIGS. 27 and 28, the procedure after the TGT is obtained by the steps S1412 or S1413 is described here.

[0236]

To be more specific, the TGT obtained in the step S1412 or S1413 and the identifier (parameter) identifying the MFP(1) 1 of the job issue destination are sent to the directory server 6 by the Kerberos protocol to obtain the access ticket for the MFP(1) 1 (step S2601). The access ticket obtained here has the information on the user name, the user ID, the user's permitted number of prints and its expiration date that are encrypted by the cryptograph key 306 of the MFP(1) 1. The data format in the access ticket and encryption (algorithm) to be used are uniquely determined in advance according to the currently corresponding directory server type 304.

[0237]

The access ticket setting command wherein the access ticket obtained in the step S2601 is set as the command parameter 2307 is generated and sent to the MFP(1) 1 (step S2602). As for the management command

sent here, the session key 2304 has the value 0 and the command type 2305 is the "access ticket setting command."

[0238]

It is determined whether or not the reply from the MFP(1) 1 is the error (step S2603), and the process is terminated in the case of the error. On the other hand, in the case where it is not the error as a result of the determination in the step S2603, the session key obtained in the step S2602 is set as the management command session key 2304, and appropriate values are set on the management command type 2305, the command parameter length 2306 and the command parameter 2307 of the management command data and they are sent to the MFP(1) 1 (step S2604). The reply from the MFP(1) 1 is processed (step S2605) to finish the process.

[0239]

Moreover, when the same user issues the job management command or the device management command to the same MFP, the required access ticket has already been held by the MFP and the session key thereto has been obtained, so that the steps from the step S2601 to the step S2603 may be omitted. Thus, the job management and the device management of the MFP can be implemented with good performance.

[0240]

As set forth above, according to the above

embodiment, unified job management can be performed as to the access in the network environment. In addition, unified job management can be performed as to the access in the network environment. Moreover, only the user who issued the job can cancel the job.

[0241]

In addition, only the user who issued the job can know the entire information on the job, and the other users can only know partial information on the job. Moreover, it is possible to perform unified job information on the access with good performance in the network environment. Furthermore, only the user who issued the job can cancel the job with good performance. Moreover, only the user who issued the job can know the entire information with good performance, and the other users can only know the partial information on the job.

[0242]

In addition, it is possible to perform unified device management as to the access in the network environment. Moreover, it is possible to perform unified device management as to the access in the network environment with good performance. It is also possible to issue the job management command to the MFPs. Furthermore, it is possible to issue a job cancel command to the MFPs. It is also possible to display the jobs to the MFPs. Furthermore, it is possible to issue the device management command to the MFPs.

[0243]

According to this embodiment, it is possible to obtain the list of the directory server types which the MFPs can support from the outside via the network and so on. In addition, it is possible to obtain and set the directory server types which the MFPs are currently supporting from the outside via the network and so on. Furthermore, it is possible to obtain the list of the directory server types which can be supported and display it on the user interface. It is also possible to obtain the directory server which can be supported and display it on the user interface and also change the settings.

[0244]

According to this embodiment, it is possible to use the unified user information on a plurality of MFPs. In addition, it is possible to centrally manage the number of accumulated prints and the maximum number of prints in the environment using a plurality of MFPs. Moreover, it is possible to limit printing for each user by the maximum number of prints in the environment using a plurality of MFPs.

[0245]

In addition, it is possible to set an operation mode to be taken in the case of a failure of connecting to the directory server from the outside via the network and so on. Furthermore, the MFPs can be used in

the case of a failure of connecting to the directory server. Moreover, the MFPs can be used within a fixed time of the final normal login in the case of a failure of connecting to the directory server. In addition, the MFPs can be used to the extent not exceeding the maximum number of prints stored in the device within the fixed time of the final normal login in the case of a failure of connecting to the directory server. Moreover, the MFPs can be used up the maximum number of prints at the time of the final normal login within the fixed time of the final normal login in the case of a failure of connecting to the directory server. In addition, the MFPs can be used to the extent not exceeding the maximum number of prints stored in the device in the case of a failure of connecting to the directory server.

[0246]

In addition, the MFPs can be used up the maximum number of prints at the time of the final normal login in the case of a failure of connecting to the directory server. Moreover, the MFPs can be used to the extent not exceeding the maximum number of prints for each login in the case of a failure of connecting to the directory server. In addition, it is possible to prohibit the user from using the MFPs in order to perform correct user management in the case of a failure of connecting to the directory server.

Furthermore, the MFPs can be used up the maximum number of prints to which the expected number of prints after normally connecting to the directory server is added. In addition, it is possible to issue the jobs to the MFPs.

[0247]

Moreover, while the embodiments of the present invention were described above, the present invention is not limited to the configurations of these embodiments, but it is applicable to any configuration capable of accomplishing the functions according to the claims or the functions that the configurations of the embodiments have.

[0248]

In addition, it is needless to say that the present invention is applicable to the cases where it can be accomplished by supplying the program to the system or the equipment by means of a record medium storing a program code of software for implementing the functions of the aforementioned embodiments. In this case, the program code read from the storage medium itself implements a new function of the present invention, so that the storage medium storing the program constitutes the present invention.

[0249]

In the above embodiments, the program code shown in each flowchart is stored in the storage medium. As

for the storage medium for supplying the program code, for instance, a ROM, a floppy disk, a hard disk, an optical disk, a magneto-optical disk, a CD-ROM, a CD-R, a DVD, a magnetic tape, a nonvolatile memory card and so on can be used.

[0250]

[Effect of the Invention]

According to the present invention, unified access control can be performed as to the job management in the network environment. In addition, the unified access control can be performed as to the job management in the network environment so that the performance will not deteriorate.

[0251]

In addition, it can provide a general purpose peripheral equipment control system wherein the peripheral equipment control software does not require the subject MFP to wait for the information on the corresponding directory server type.

[0252]

Moreover, the unified management of the user information is performed so that the same user information can be used by a plurality of devices in the environment for using a plurality of devices connected to the network and so on. In addition, it is possible to perform central management of the accumulated number of prints and the maximum number of

prints of the user in the environment for using a plurality of devices connected to the network and so on. Furthermore, it is possible to temporarily use the MFPs in the case of a network failure.

[Brief Description of the Drawings]

[FIGURE 1]

A block diagram showing a configuration of a peripheral equipment control system according to the first embodiment.

[FIGURE 2]

A block diagram showing a configuration of peripheral equipment (an MFP(1) and an MFP(2)).

[FIGURE 3]

A block diagram showing a hardware configuration of a controller 11.

[FIGURE 4]

A block diagram showing the hardware configuration of a PC constituting a network system.

[FIGURE 5]

A diagram showing attribute information held by the peripheral equipment 1.

[FIGURE 6]

A flowchart showing a procedure for displaying and/or changing a user management mode of the peripheral equipment 1 from a PC(1), a PC(2) and a PC(3).

[FIGURE 7]

A diagram showing a user interface screen displayed on a CRT 33 in a state of waiting for user-input in a step S1705.

[FIGURE 8]

A flowchart showing an operating procedure for displaying and/or changing a directory server corresponding to the peripheral equipment 1 from the PC(1), the PC(2) and the PC(3).

[FIGURE 9]

A diagram showing user interface screen displayed on a CRT 33 in a state of waiting for user-input in a step S1807.

[FIGURE 10]

A flowchart showing the procedure for displaying and/or changing how to permit a login from the PC(1), the PC(2) and the PC(3) in the case where the peripheral equipment 1 cannot be connected to a directory server 6.

[FIGURE 11]

A diagram showing a user interface screen displayed on a CRT 33 in a state of waiting for user-input in a step S2207.

[FIGURE 12]

A flowchart showing the procedure for issuing a print job, a scanner job, a fax transmission job and a copy job from the PC(1), the PC(2) and the PC(3) to the peripheral equipment 1.

[FIGURE 13]

A flowchart following FIG. 12 for showing the procedure for issuing a print job, a scanner job, a fax transmission job and a copy job from the PC(1), the PC(2) and the PC(3) to the peripheral equipment 1.

[FIGURE 14]

A flowchart showing the procedure for issuing a job in a step S403.

[FIGURE 15]

A flowchart showing the procedure for receiving a job submitting command when the peripheral equipment 1 receives the job issued by the process in FIG. 14.

[FIGURE 16]

A flowchart following FIG. 15 for showing the procedure for receiving the job submitting command when the peripheral equipment 1 receives the job issued by the process in FIG. 14.

[FIGURE 17]

A diagram showing a data structure of the job held in the peripheral equipment 1 as a result of the process in FIG. 14.

[FIGURE 18]

A flowchart showing the procedure of the job data held in the peripheral equipment 1 shown in FIG. 17.

[FIGURE 19]

A flowchart following FIG. 18 for showing the

procedure of the job data held in the peripheral equipment 1 shown in FIG. 17.

[FIGURE 20]

A flowchart showing a login procedure from an operation division of the peripheral equipment 1.

[FIGURE 21]

A flowchart following FIG. 20 for showing the login procedure from the operation division of the peripheral equipment 1.

[FIGURE 22]

A diagram showing the data structure of a user information cache.

[FIGURE 23]

A flowchart showing the procedure of a print pending job in steps S924 and S922.

[FIGURE 24]

A diagram showing the user interface screen displayed on an LCD 23 in a step S1104.

[FIGURE 25]

A flowchart showing the procedure when the peripheral equipment 1 receives an access command for obtaining or setting individual attribute information from the PC(1), the PC(2) and the PC(3).

[FIGURE 26]

A flowchart following FIG. 25 for showing the procedure when the peripheral equipment 1 receives an access command for obtaining or setting the individual

attribute information from the PC(1), the PC(2) and the PC(3).

[FIGURE 27]

A flowchart showing the procedure for issuing a management command such as device management or job management from the PC(1), the PC(2) and the PC(3) to the peripheral equipment 1.

[FIGURE 28]

A flowchart following FIG. 27 for showing the procedure for issuing a management command such as device management or job management from the PC(1), the PC(2) and the PC(3) to the peripheral equipment 1.

[FIGURE 29]

A diagram showing the data structure of the management command.

[FIGURE 30]

A flowchart showing the procedure for peripheral equipment 1 to process the management command generated by the process in FIG. 22 and sent to the peripheral equipment 1.

[FIGURE 31]

A flowchart following FIG. 30 for showing the procedure for peripheral equipment 1 to process the management command generated by the process in FIG. 22 and sent to the peripheral equipment 1.

[FIGURE 32]

A flowchart showing the procedure for totaling

the logs of the peripheral equipment 1 and the peripheral equipment 5 and updating the permitted number of prints and the number of accumulated prints for each user of the directory server 6.

[FIGURE 33]

A flowchart showing a computing procedure for computing the permitted number of prints when it is impossible to connect to the directory server in the step S923 in FIG. 17.

[FIGURE 34]

A flowchart following FIG. 33 for showing a computing procedure for computing the permitted number of prints when it is impossible to connect to the directory server in the step S923 in FIG. 17.

[FIGURE 35]

A diagram showing the data structure of the management command generated by a management command generation process mentioned later and sent to the peripheral equipment 1.

[FIGURE 36]

A diagram showing the data structure of an access ticket cache held in a RAM 22 of the peripheral equipment 1 by the process of an access ticket setting command mentioned later.

[FIGURE 37]

A flowchart showing the procedure for the peripheral equipment 1 to process the management

command generated by a management command generation process mentioned later and sent to the peripheral equipment 1.

[FIGURE 38]

A flowchart following FIG. 37 for showing the procedure for peripheral equipment 1 to process the management command generated by the management command generation process mentioned later and sent to the peripheral equipment 1.

[FIGURE 39]

A flowchart showing the procedure for issuing a management command such as device management or job management from the PC(1), the PC(2) and the PC(3) to the peripheral equipment 1 performing the process in FIG. 29.

[Description of Reference Numerals or Symbols]

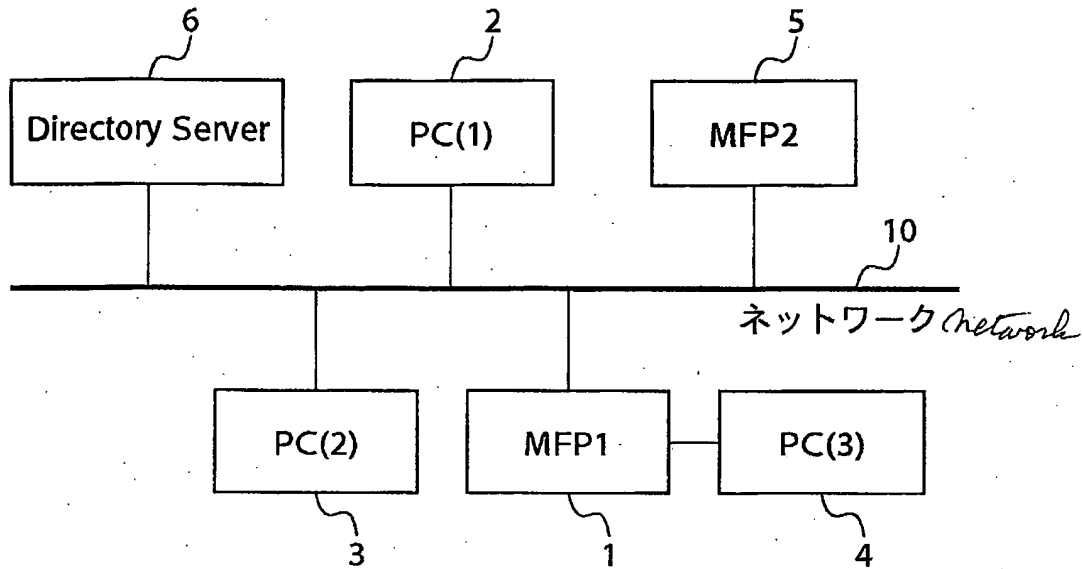
2, 3, 4 ... personal computer (PC)
 3, 5 ... peripheral equipment (MFP)
 6 ... directory server
 11 ... controller
 21, 31 ... CPU
 25, 36 ... ROM
 301, 302 ... Attribute information
 724, 1502, 2302 ... user ID
 726, 1504, 2402 ... access ticket
 2304, 2401 ... session key

【書類名】

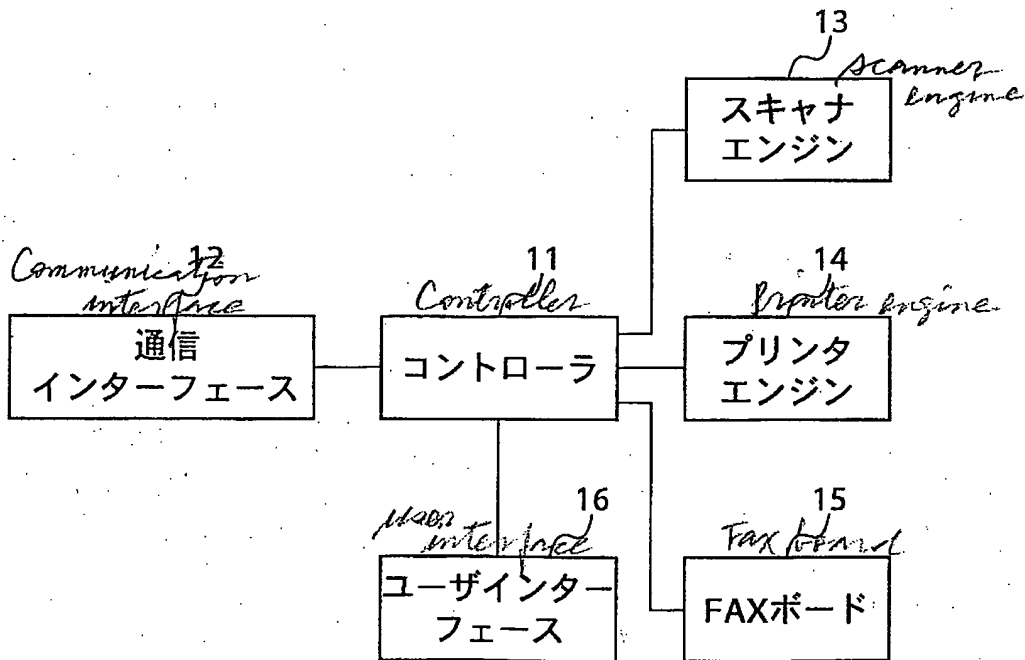
図面

[Name of the Document] Drawings

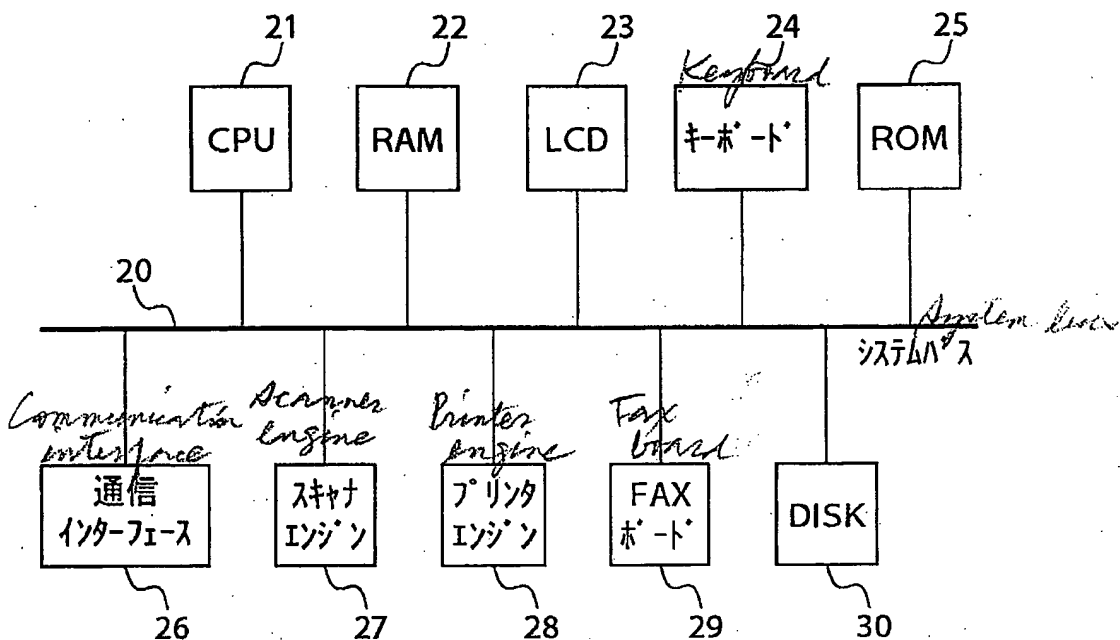
【図1】 FIG. 1



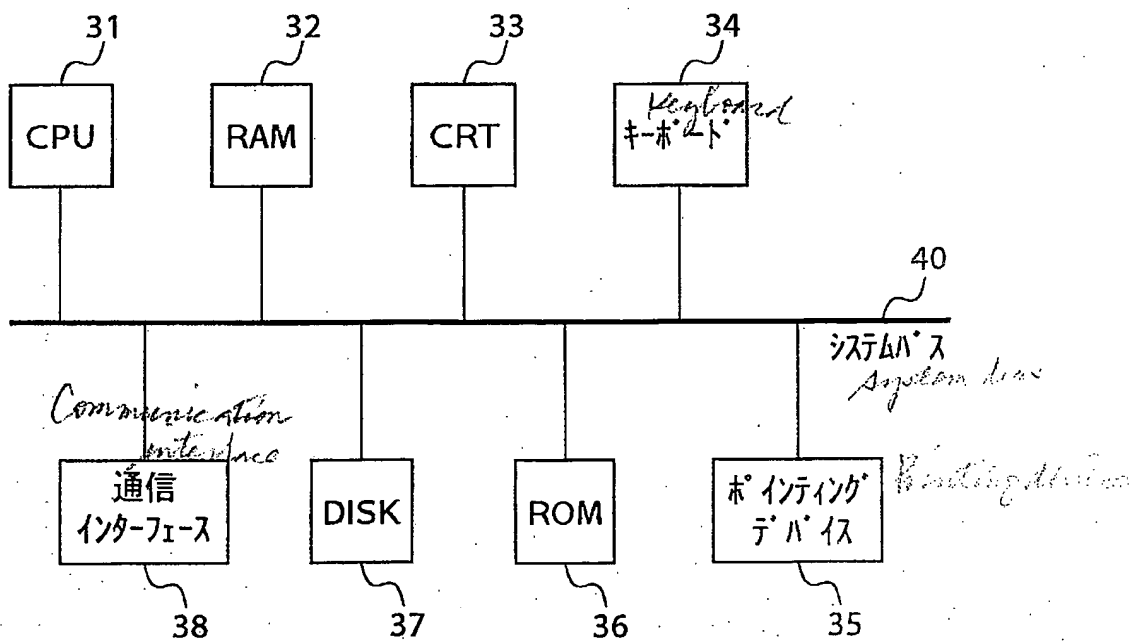
【図2】 FIG. 2



【図3】 FIG. 3



【図4】 FIG. 4



【図5】 FIG. 5

310 Attribute name	311 Set value	312 Read/Write
301 現在対応しているユーザ管理モードのリスト	"no user management", "password", "user ID", "user ID & password", "join security domain", "セキュリティ・メインに参加"	Read Only
302 現在のユーザ管理モード	"セキュリティ・メインに参加"	Read/Write
303 対応可能なDirectory Serverの種類リスト	"標準LDAPサーバ", "Active Directory(MS)", "NDS(Novell)", "Open LDAP"	Read Only
304 現在対応しているDirectory Serverの種類	"Active Directory(MS)"	Read/Write
305 現在対応しているDirectory ServerのIPアドレス	123.56.54.21	Read/Write
306 機器の秘密暗号鍵	0x34q4bffcda001	Write Only
307 Directory Server接続不可時に使用許可するかどうか	TRUE	Read/Write
308 Directory Server接続不可時に使用する場合の制限の種類のリスト	"無制限", "時間制限", "時間制限&固定最大枚数で制限", "時間制限&最大枚数で制限", "固定最大枚数で制限", "最大枚数で制限", "ログイン毎に制限"	Read Only
309 現在のDirectory Server接続不可時に使用する場合の制限の種類	"時間制限", "Time"	Read/Write
310 制限時間の長さ	48時間 48 hours	Read/Write
311 最大枚数の日毎の削減割合	30	Read/Write
312 最大枚数	100	Read/Write
313 ログイン毎の最大枚数	20	Read/Write

Max. No. of prints for each login

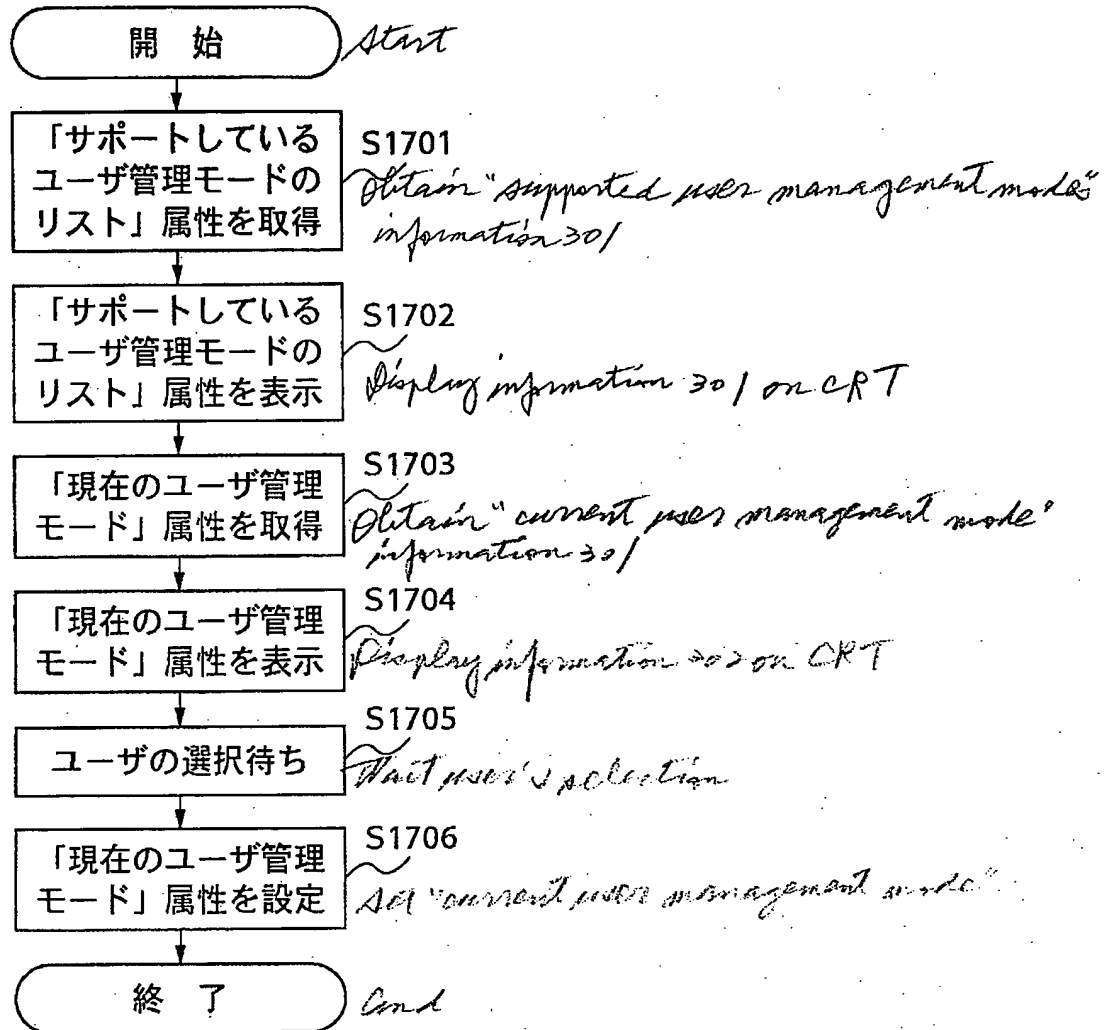
Joint security domain

Standard load server, Active Directory (MS), NDS(Novell), Open LDAP

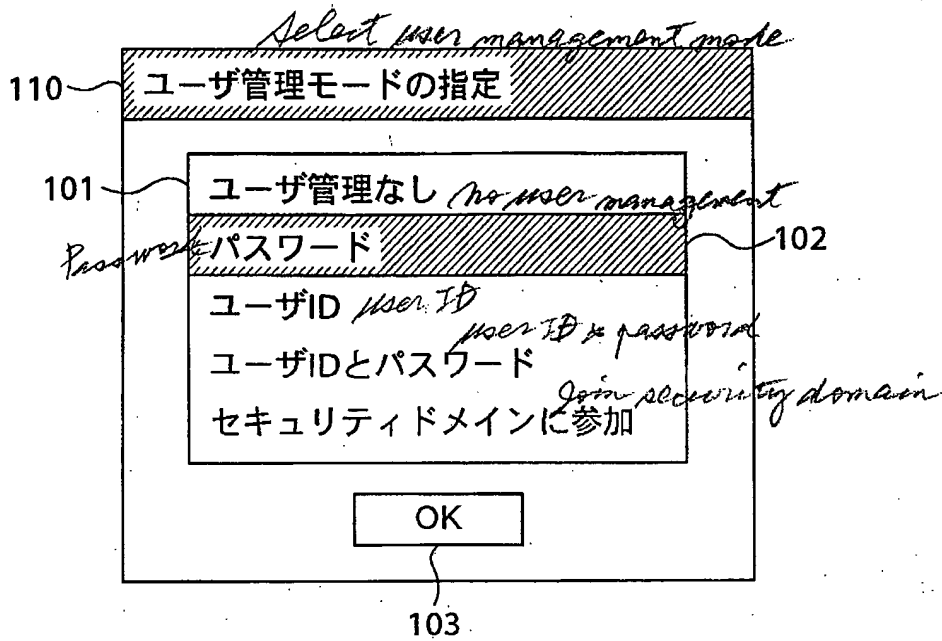
No limit, Time, Time & fixed max. No. of prints, Time & max. No. of prints, fixed max. No. of prints, max. No. of prints for each login

整理番号=4260030

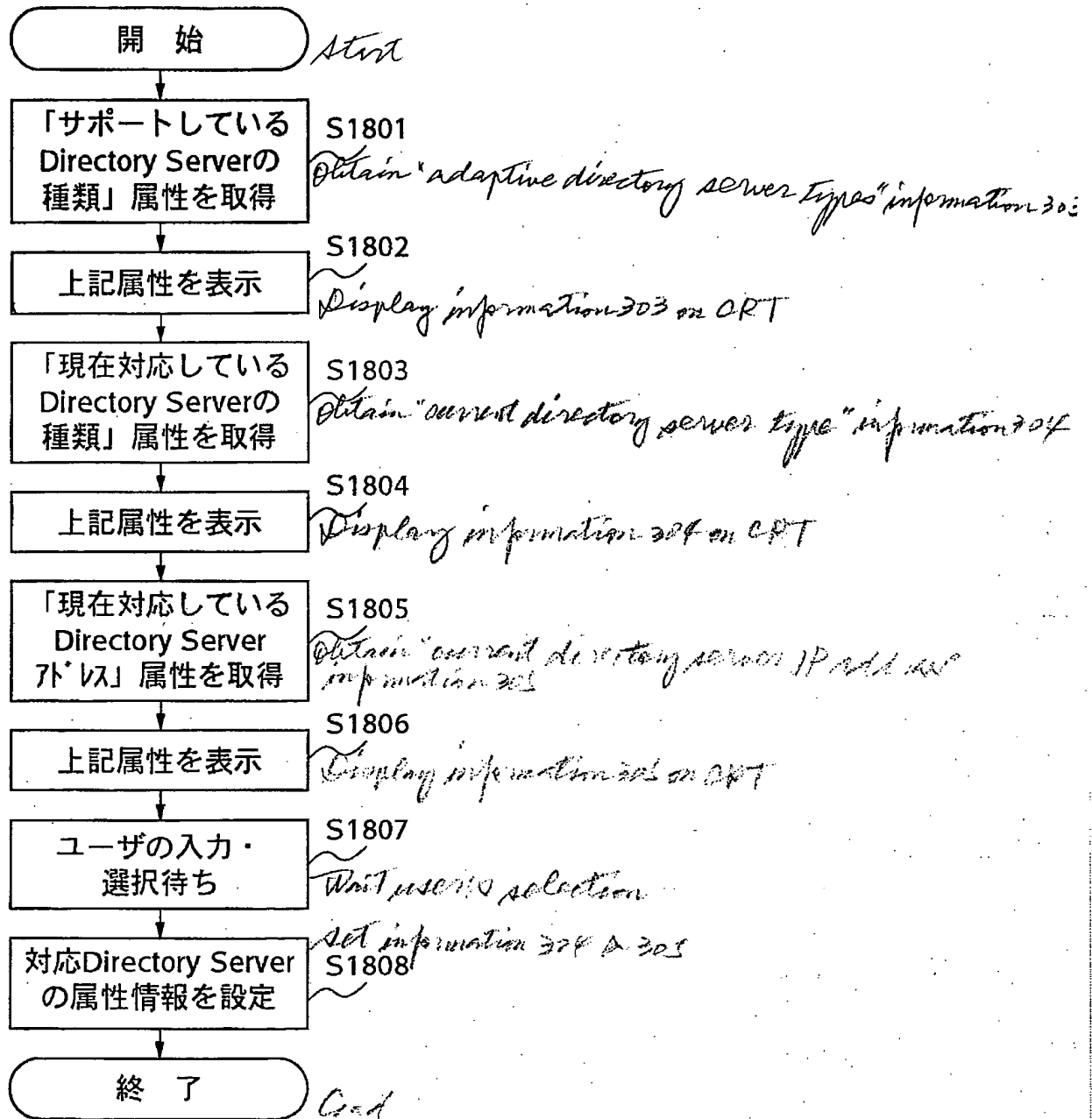
【図6】 FIG. 6



【図7】 *Flg. 7*



【図8】 FIG. 8



【図9】 *FIG. 9*

Set directory server

210 対応Directory Serverの設定

種類: *Type*

201 標準LDAPサーバ *Standard LDAP server*

Active Directory(MS) 202

NDS(Novell)

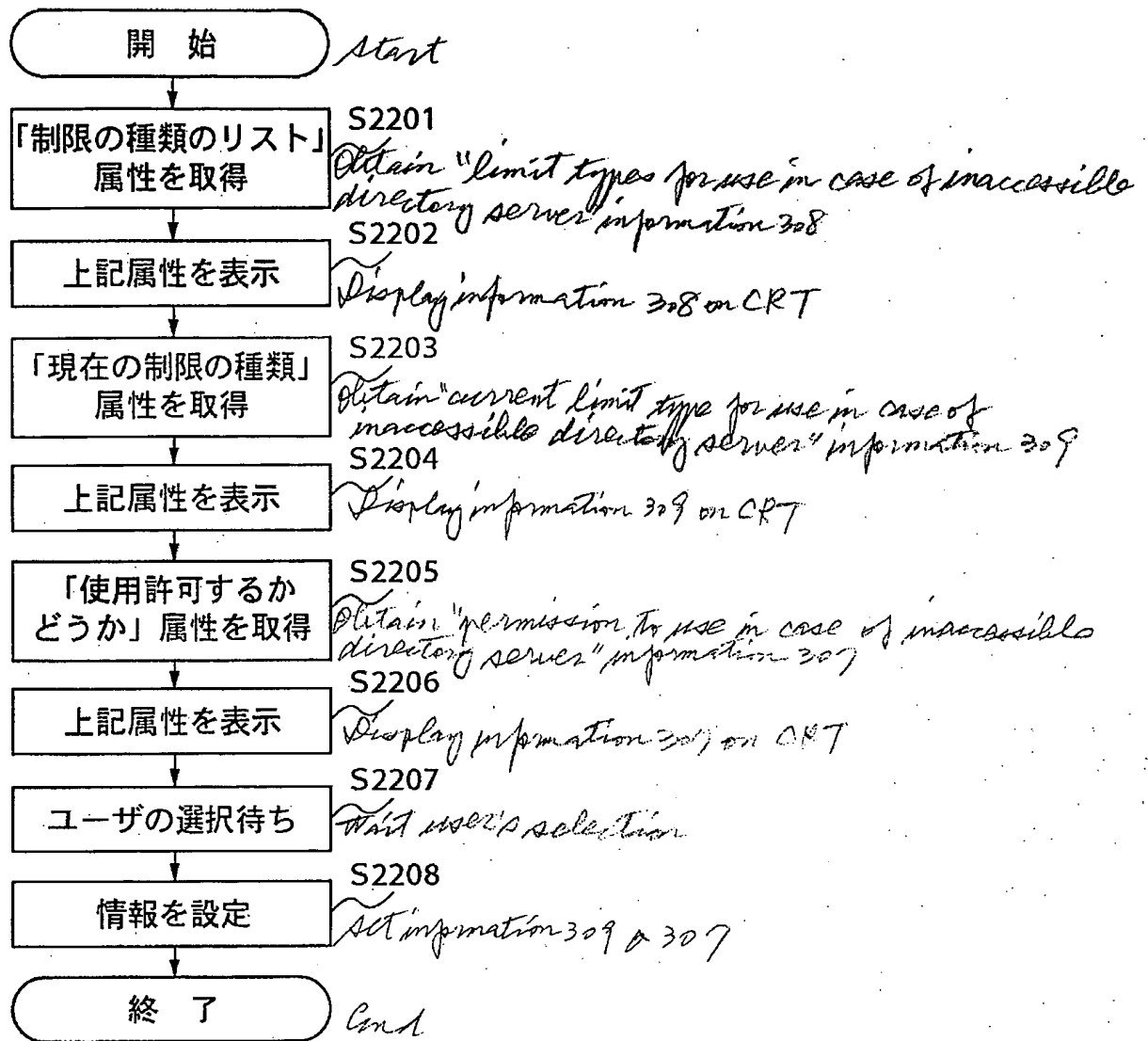
Street Talk

Open LDAP

Address
アドレス: 123.35.21.23 203

OK 204

【図10】 FIG. 10



【図11】 FIG. 11

Set operation in case of inaccessible directory server.

ディレクトリサーバ接続不能時の動作設定

2101 ☐ *Permit login in case of inaccessible directory server*
ディレクトリサーバ接続不能時にログイン可能

使用制限の種類 *Limit type*

2102 無制限 *No limit*
時間制限 *Time*
時間制限 & 固定最大枚数で制限 *Time & fixed max. No. of prints*
時間制限 & 最大枚数で制限 *Time & max. No. of prints*

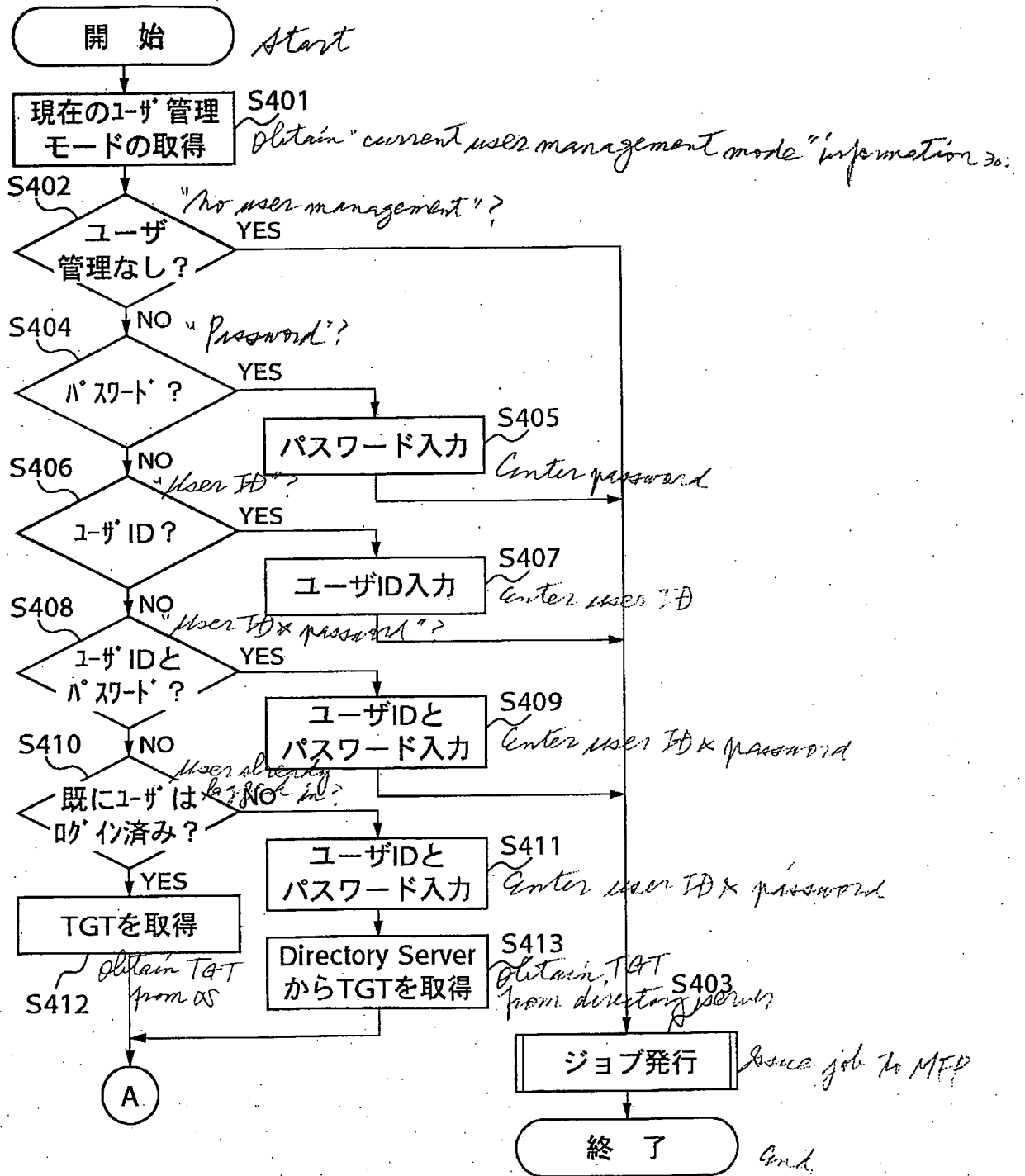
2103 固定枚数で制限 *Fixed & max. No. of prints*
最大枚数で制限 *Max. No. of prints*
ログイン毎に制限 *For each login*

OK

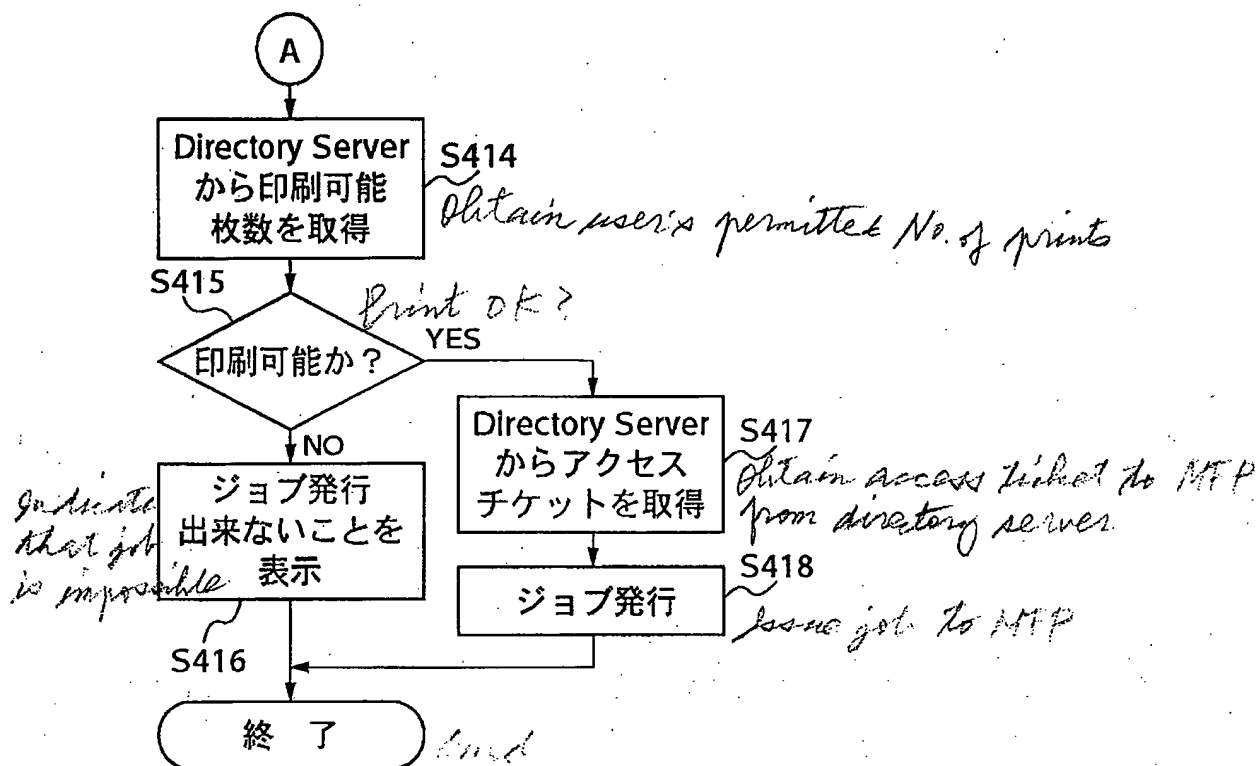
2104

整理番号=4260030

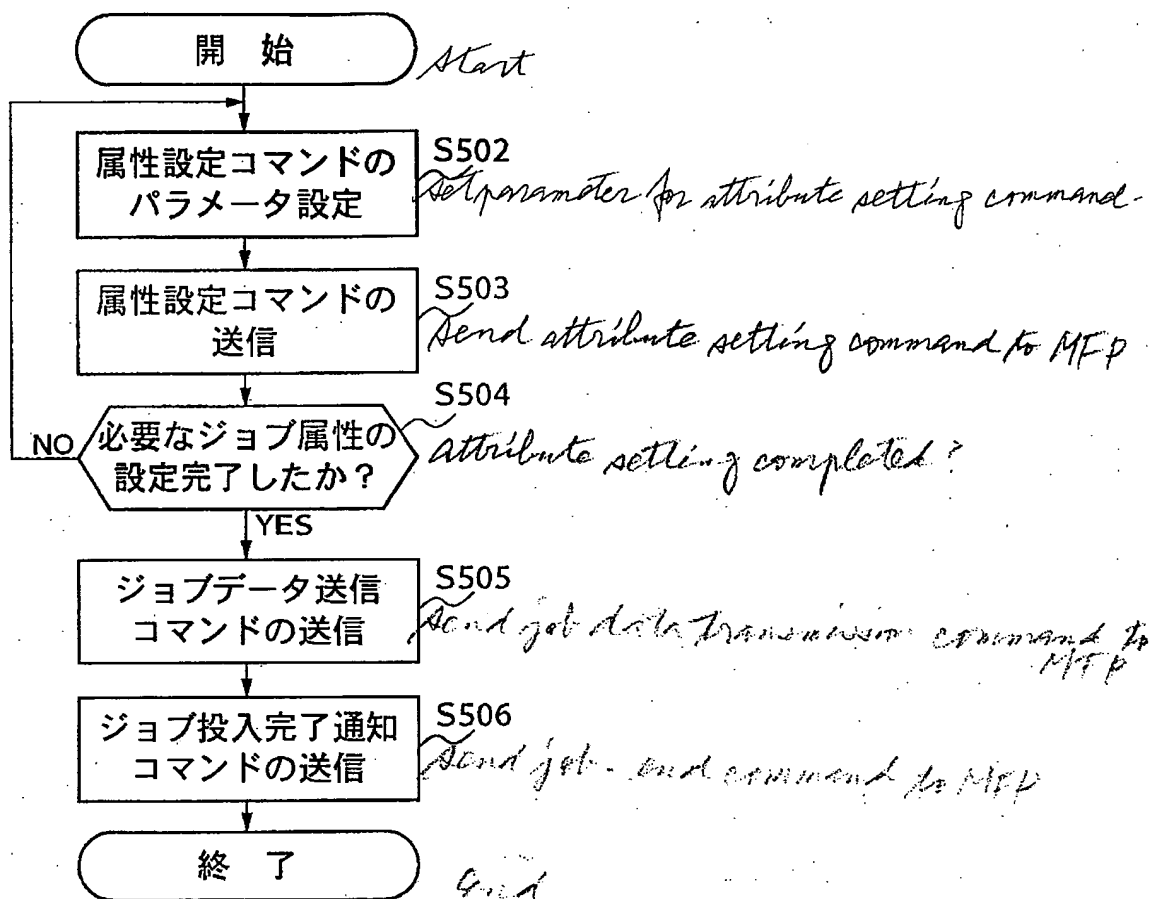
【図12】 FIG.12



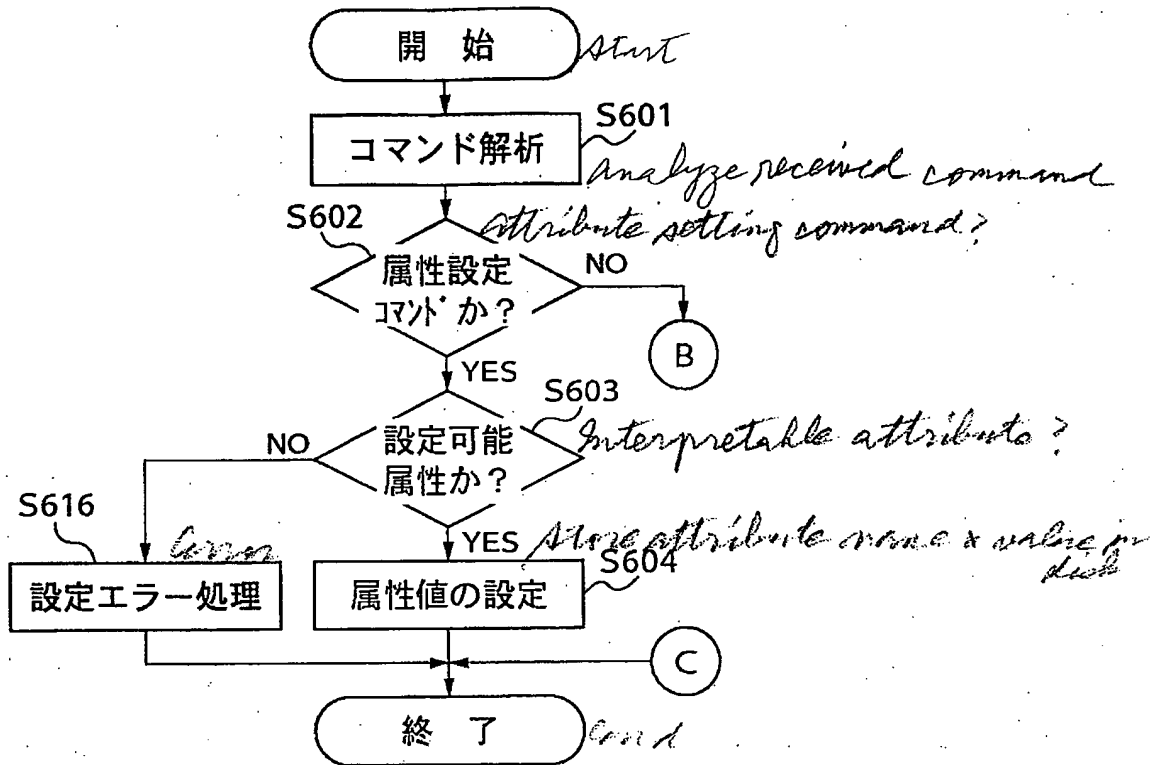
【図13】 FIG. 13



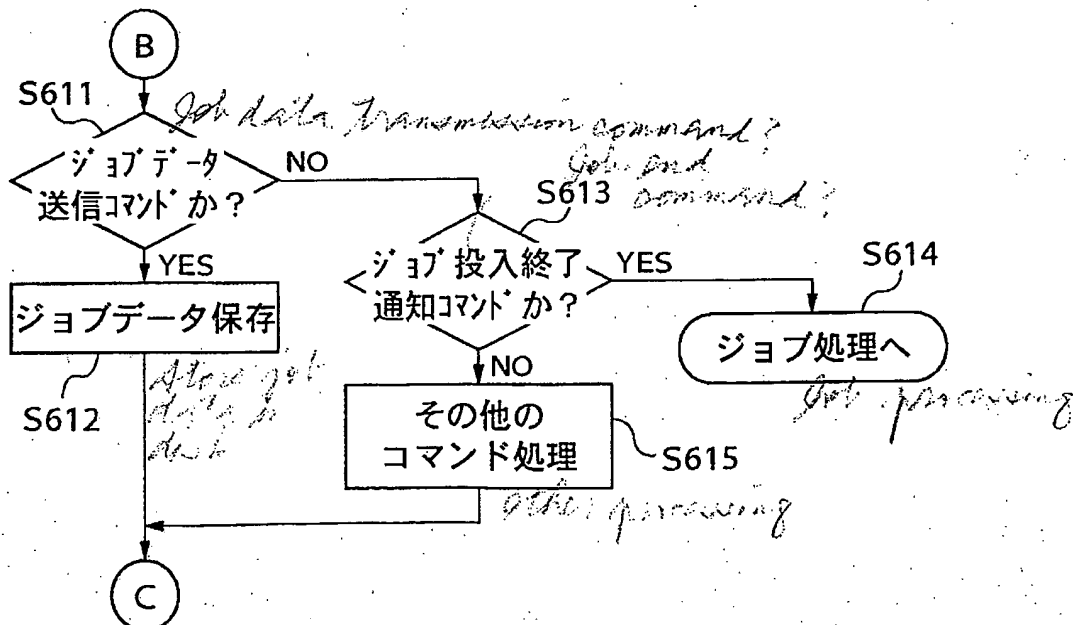
【図14】 Fig. 14



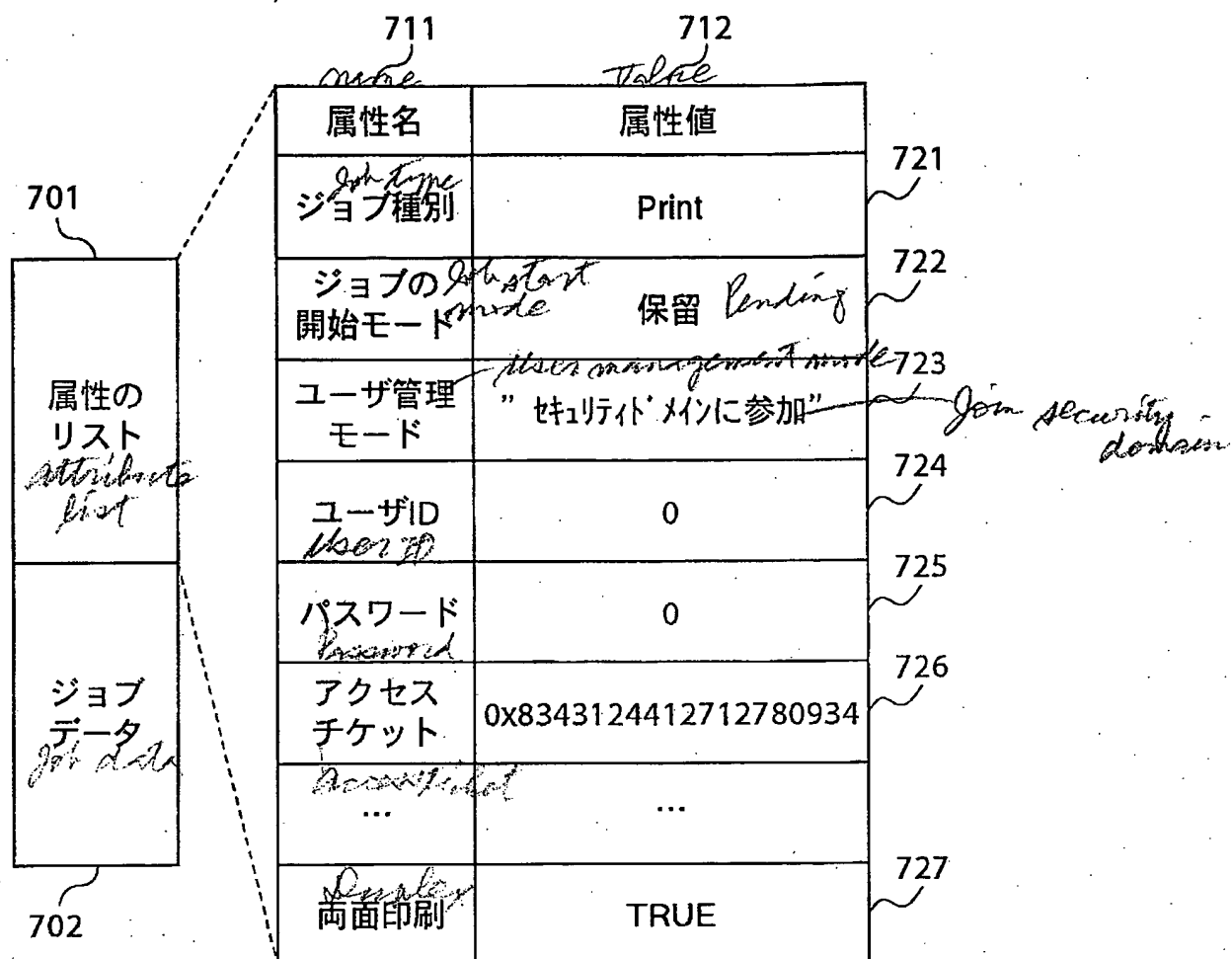
【図15】 Fig.15



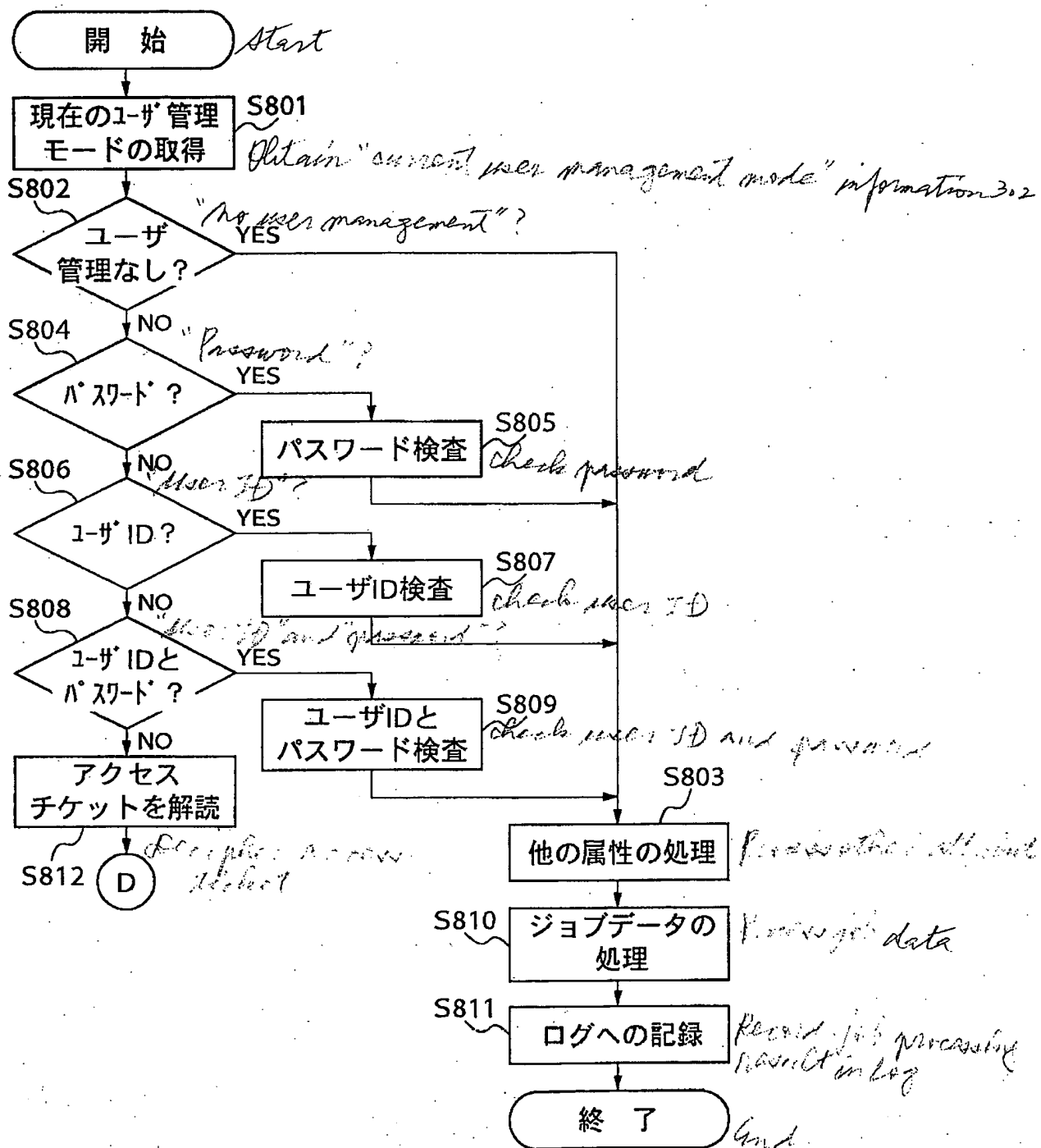
【図16】 Fig.16



【図17】 *Fig. 17*

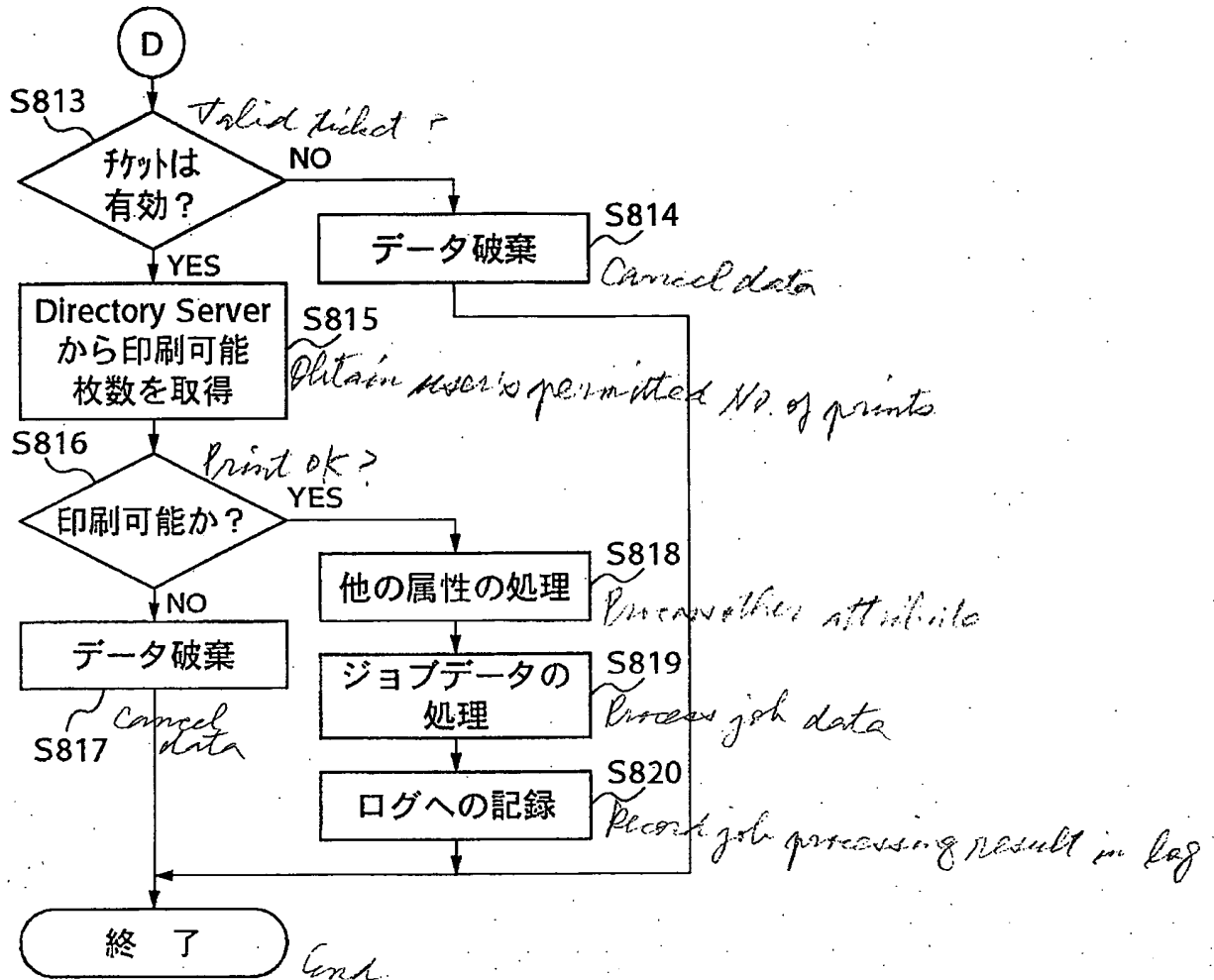


【図18】 Fig. 18



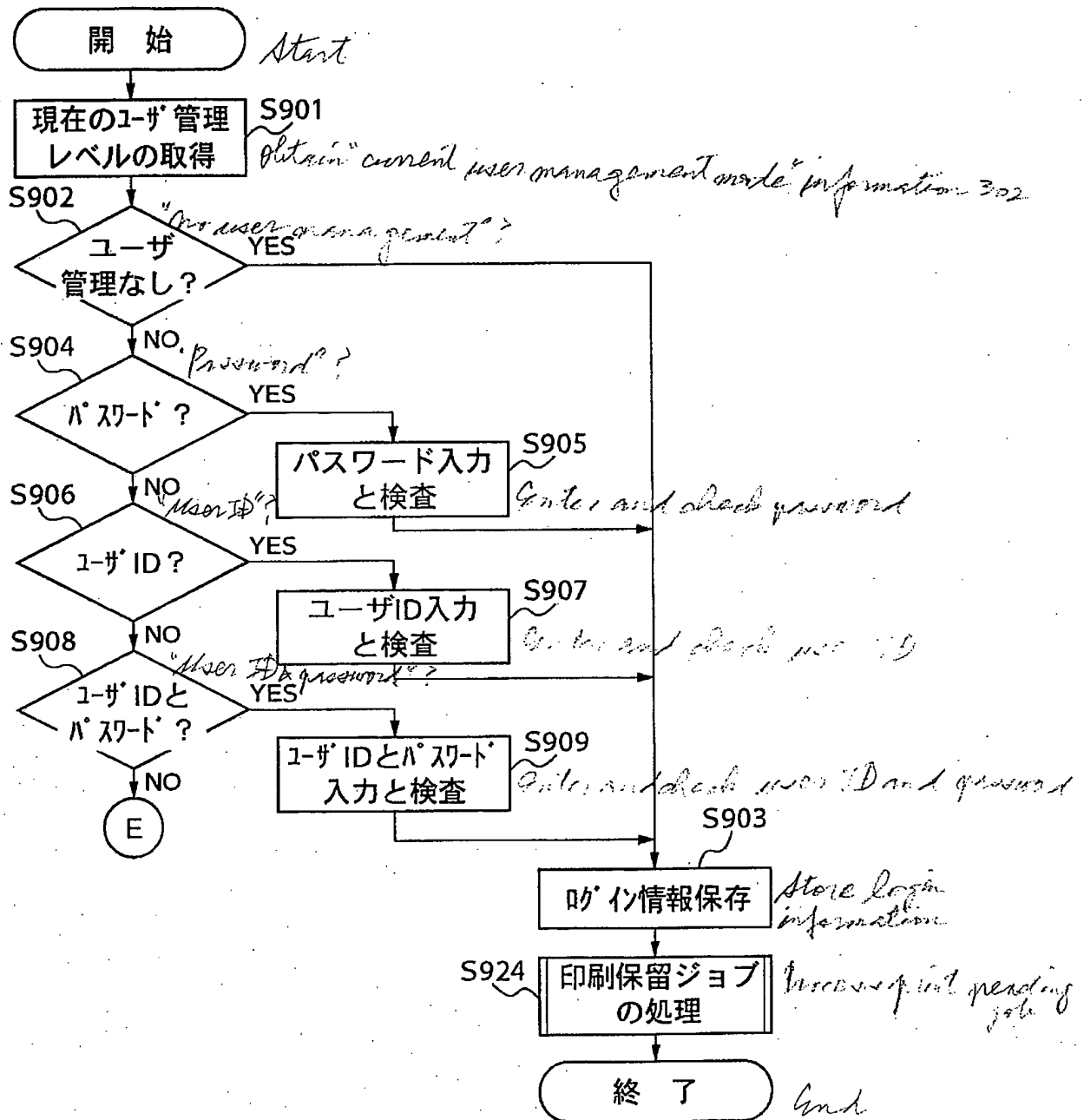
整理番号=4260030

【図19】 FIG. 19



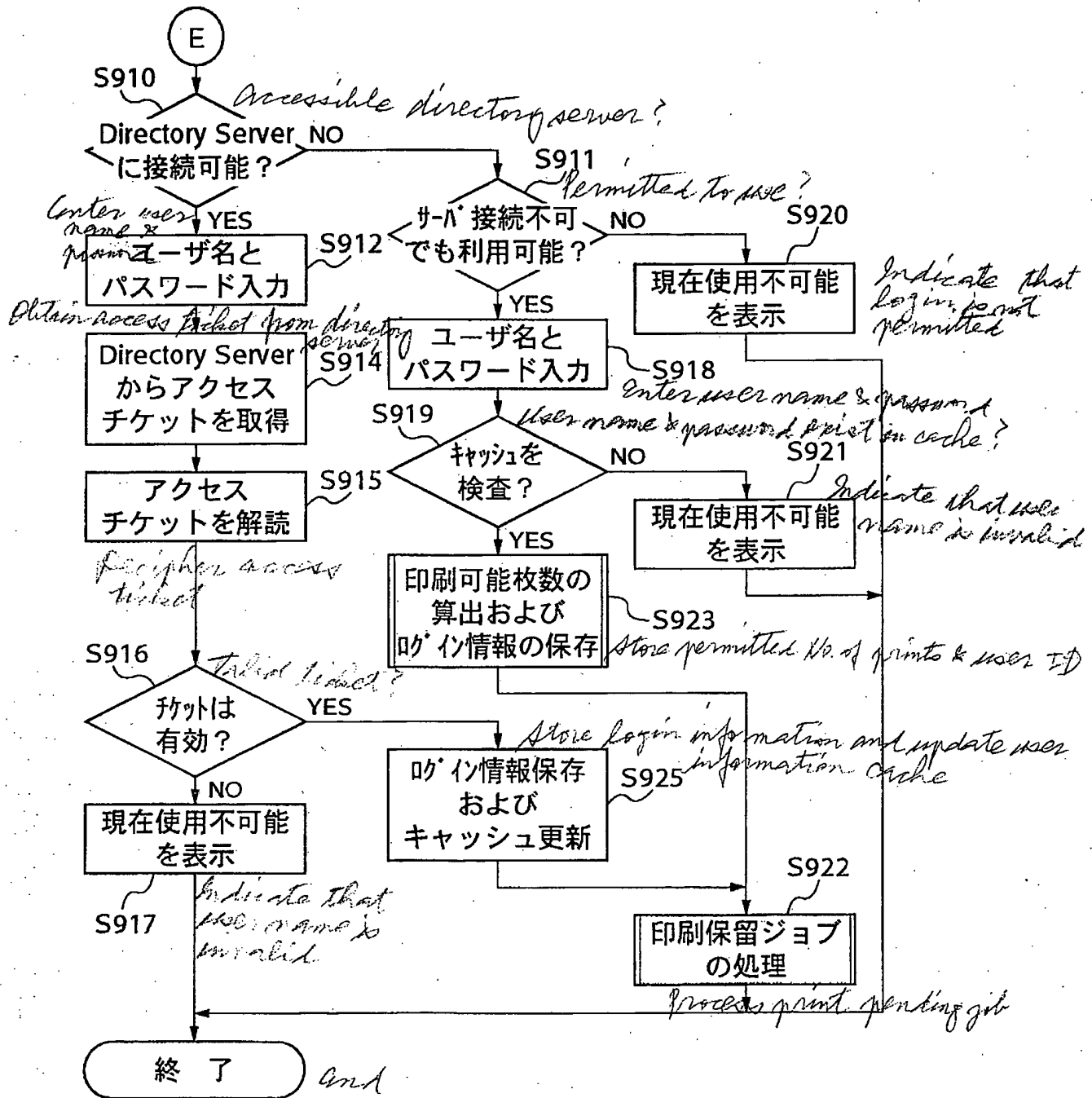
整理番号=4260030

【図20】 Fig. 20



整理番号=4260030

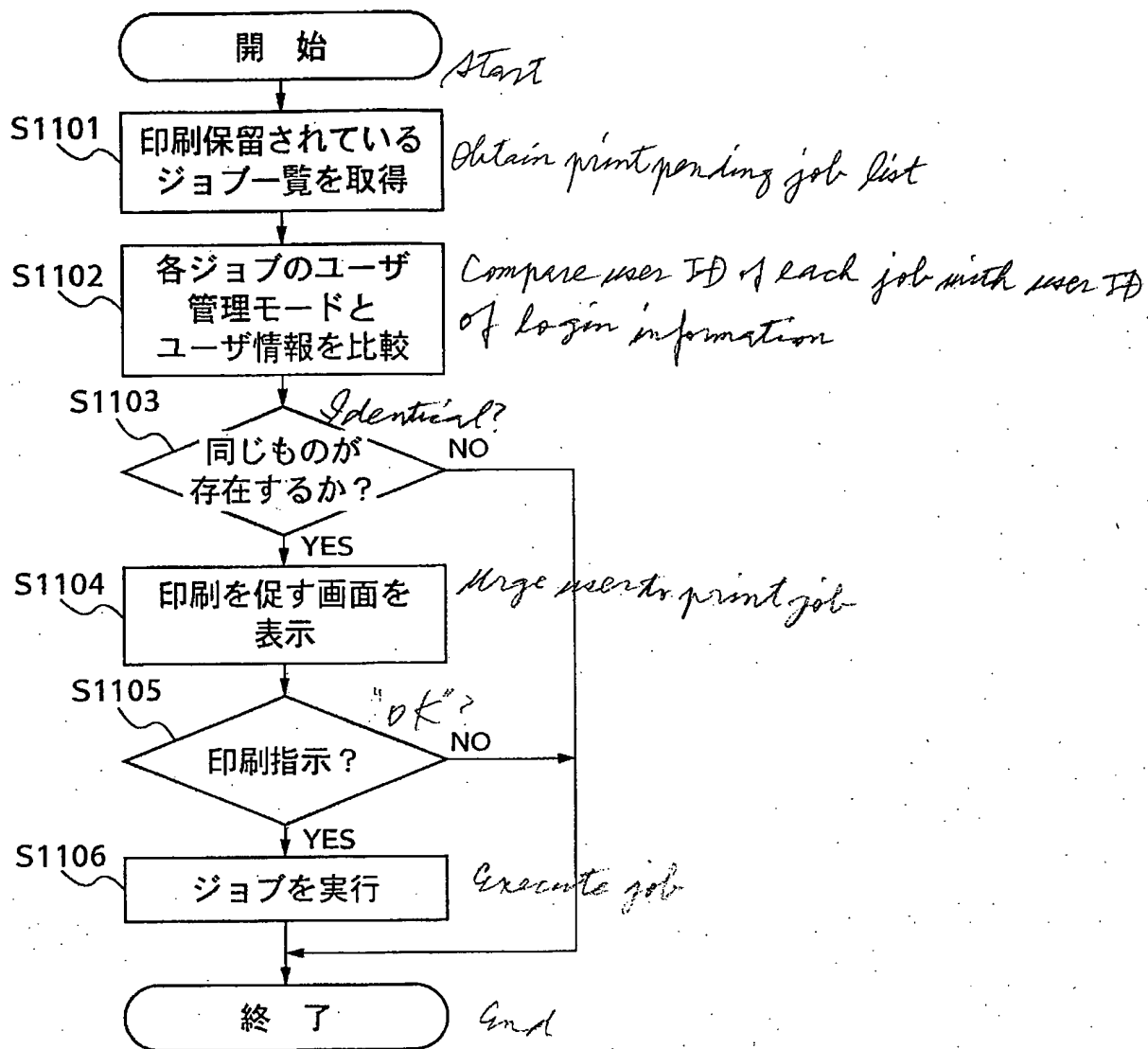
【図21】 FIG. 21



【図22】 *Fig. 22*

	1010 <i>Username</i>	1011 <i>Password</i>	1012 <i>User ID</i>	1013 <i>Permitted No. of prints</i>	1014 <i>Login time</i>
	ユーザ名	パスワード	ユーザID	印刷可能 枚数	ログイン 日時
1001	endo	tomoaki	1234	300	2000/06/05/ 10:23
1002	shimotai	naoko	4532	1000	2000/06/04/ 13:52
1003	takagi	tomoko	2354	6000	2000/06/04/ 23:12

【図23】 FIG. 23



【図24】 *FIG. 24*

Print pending job

印刷保留ジョブ

1200 以下のジョブが保留されています。
直ちに印刷しますか？

*The following jobs are pending.
Print immediately?*

1201

<i>Time</i> 時刻	<i>Job name</i> ジョブ名
11:10	辞表 AAAX
12:20	履歴書 BBSY
13:50	自己申告書 CCCZ

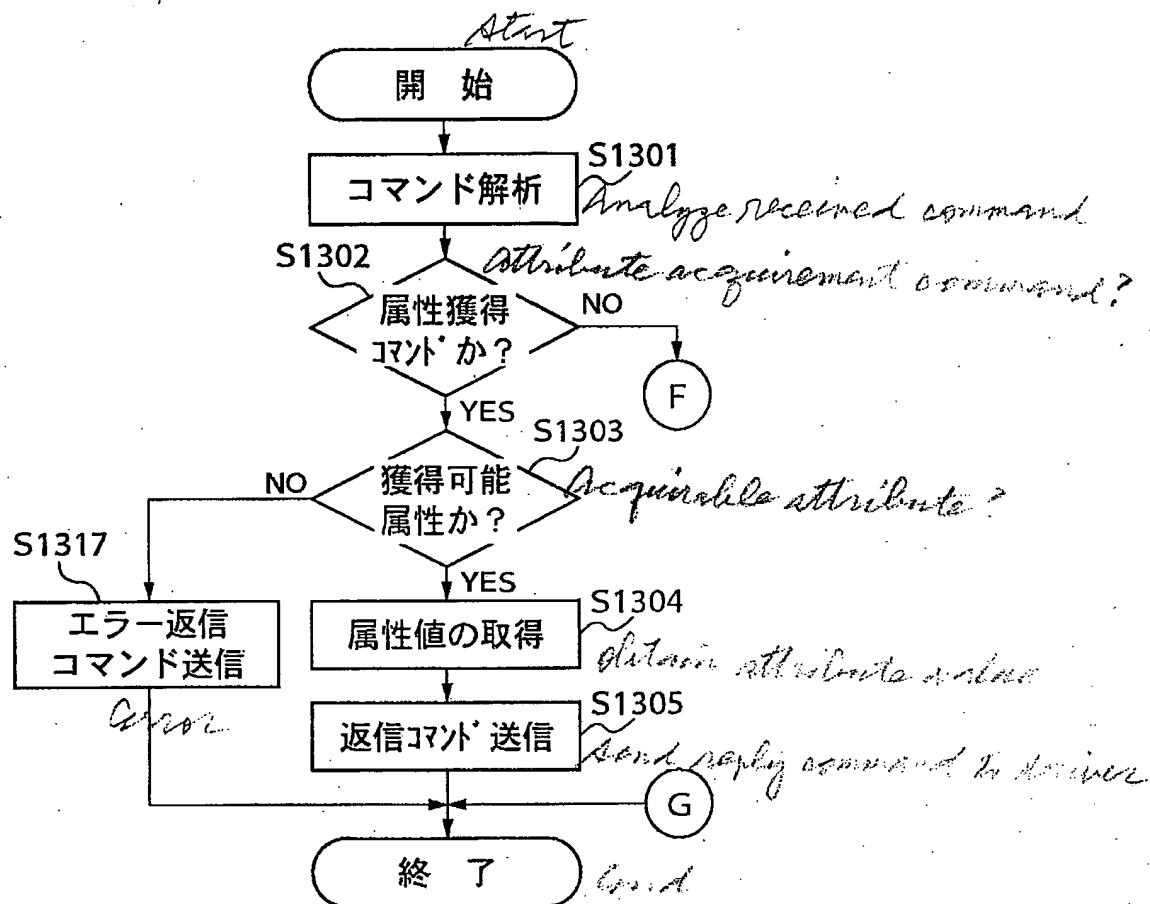
1202

OK

Cancel
キャンセル

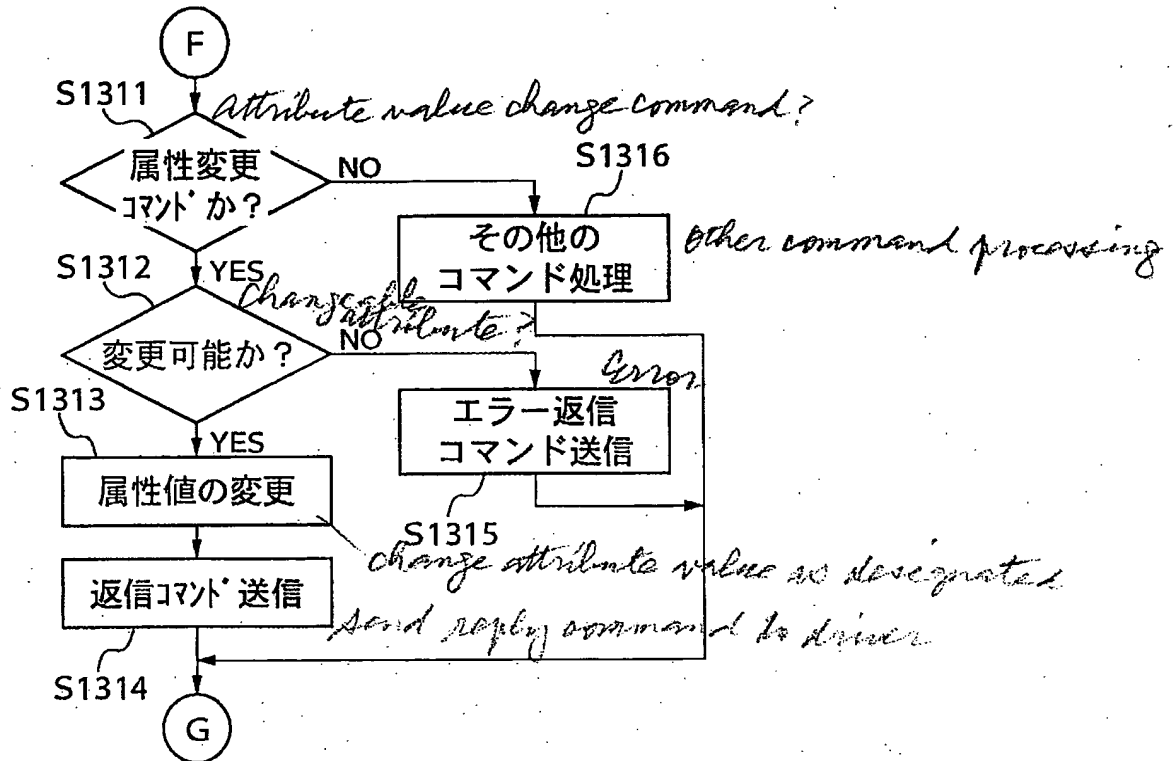
1203 1204

【図25】 Fig. 25



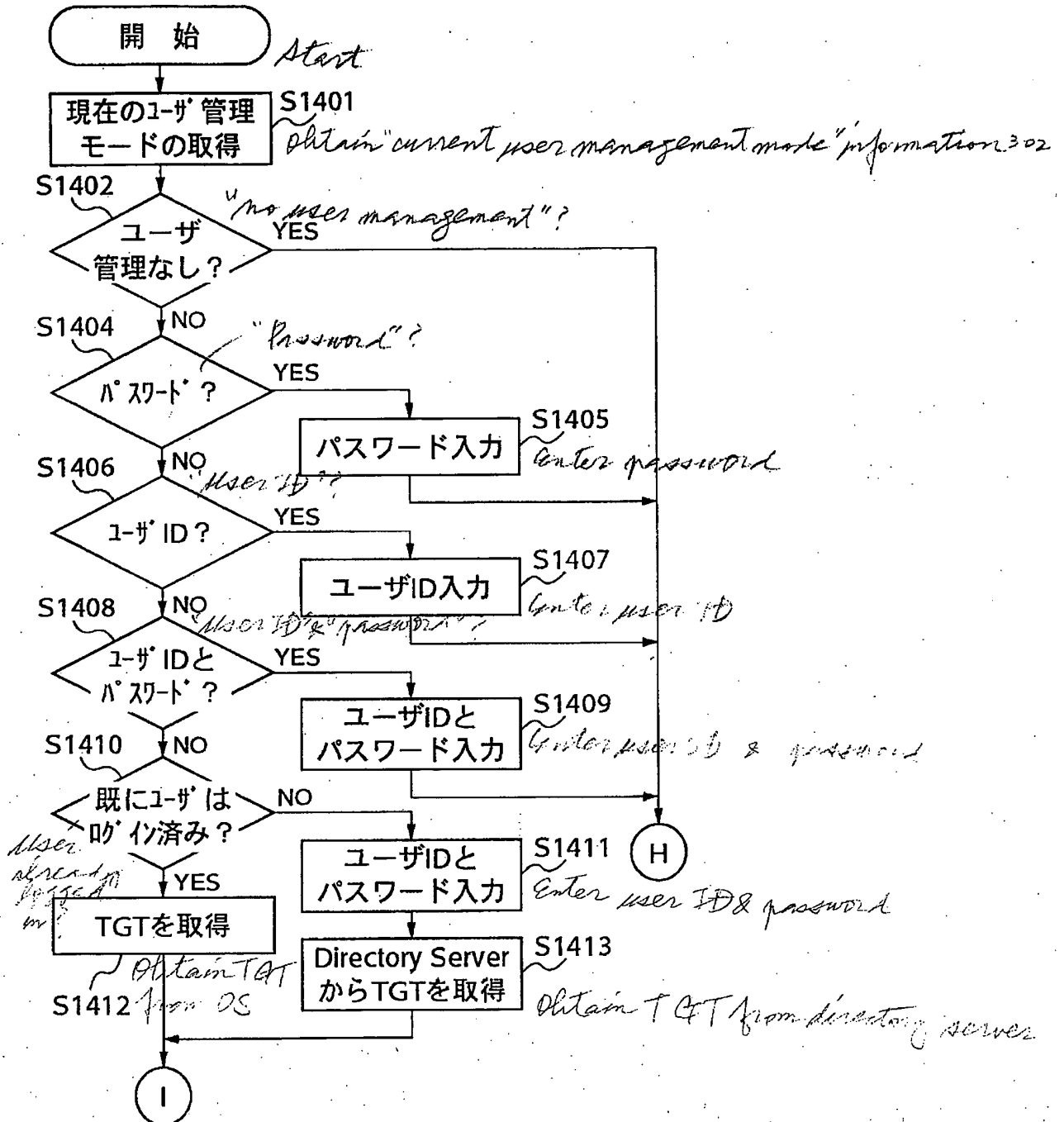
整理番号=4260030

【図26】 Fig. 26



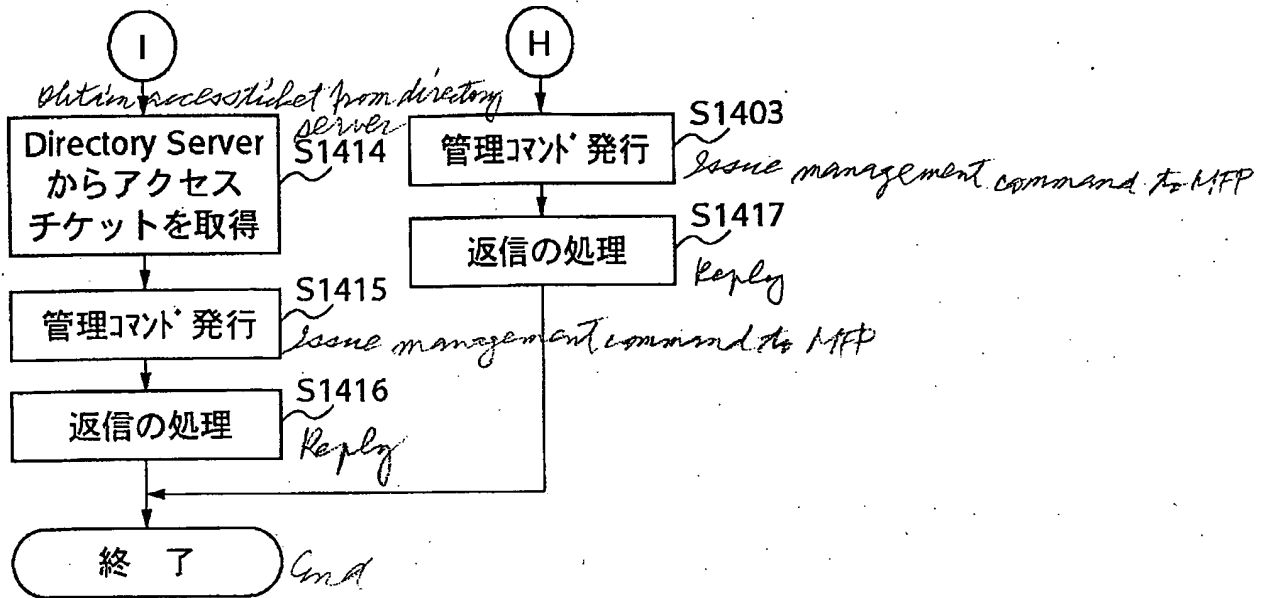
整理番号=4260030

【図27】 F14.27

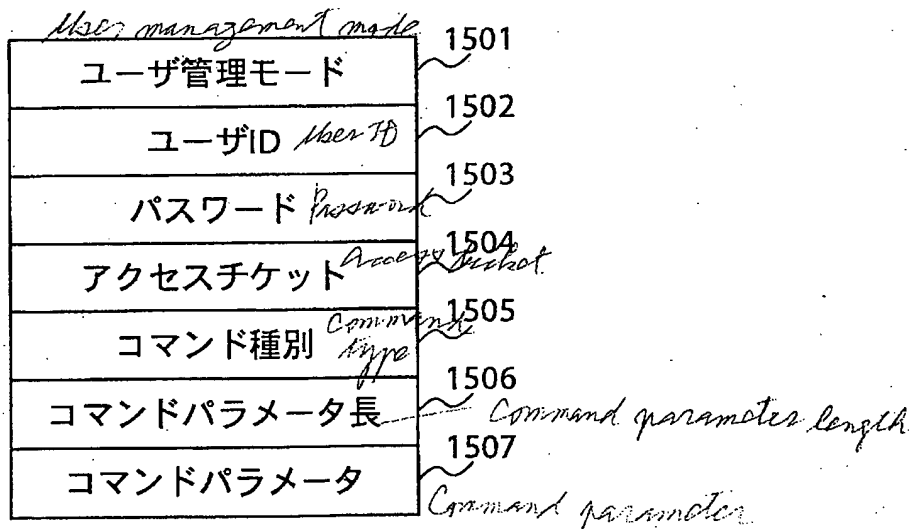


整理番号=4260030

【図28】 F19, 28

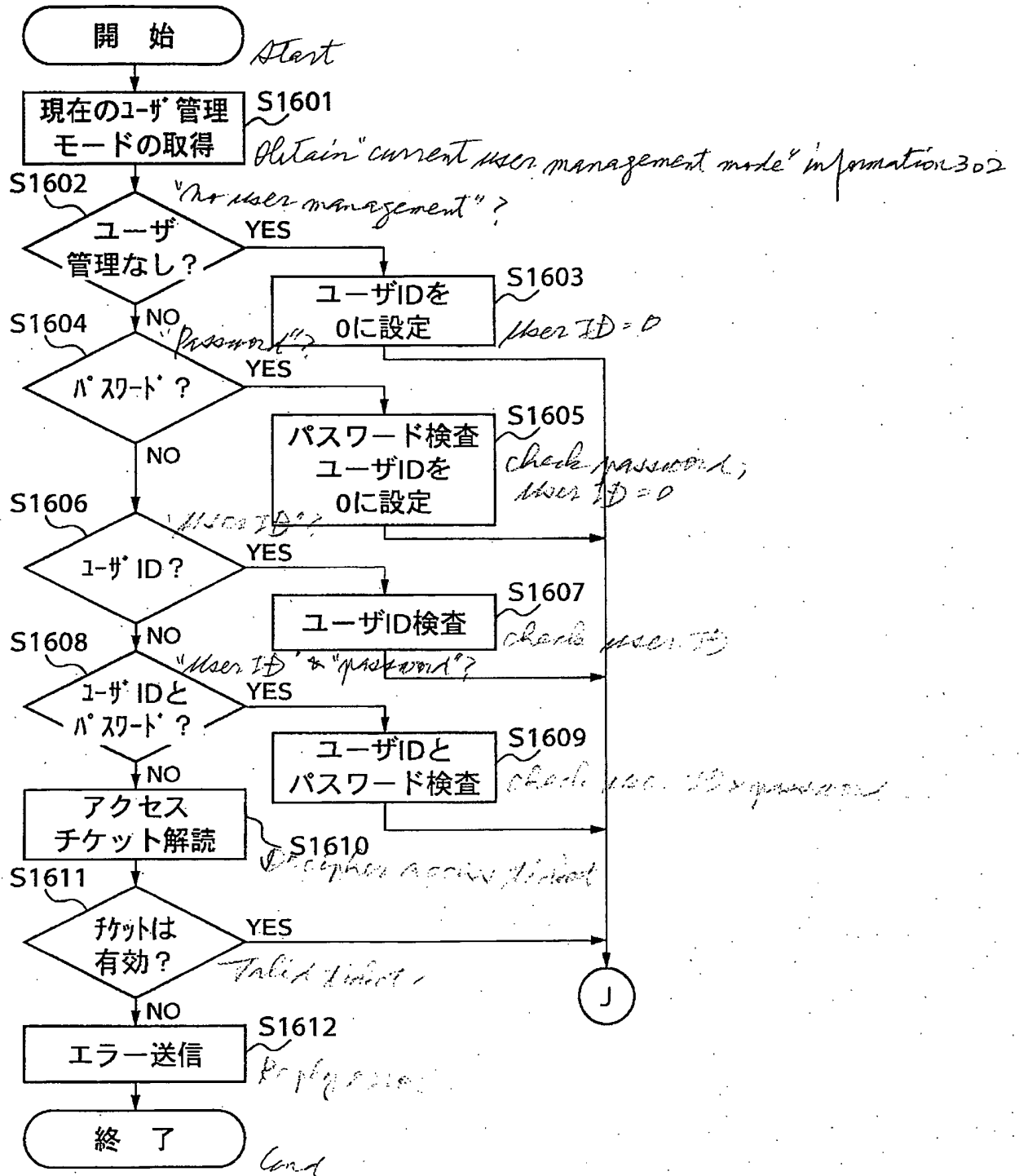


【図29】 F19, 29



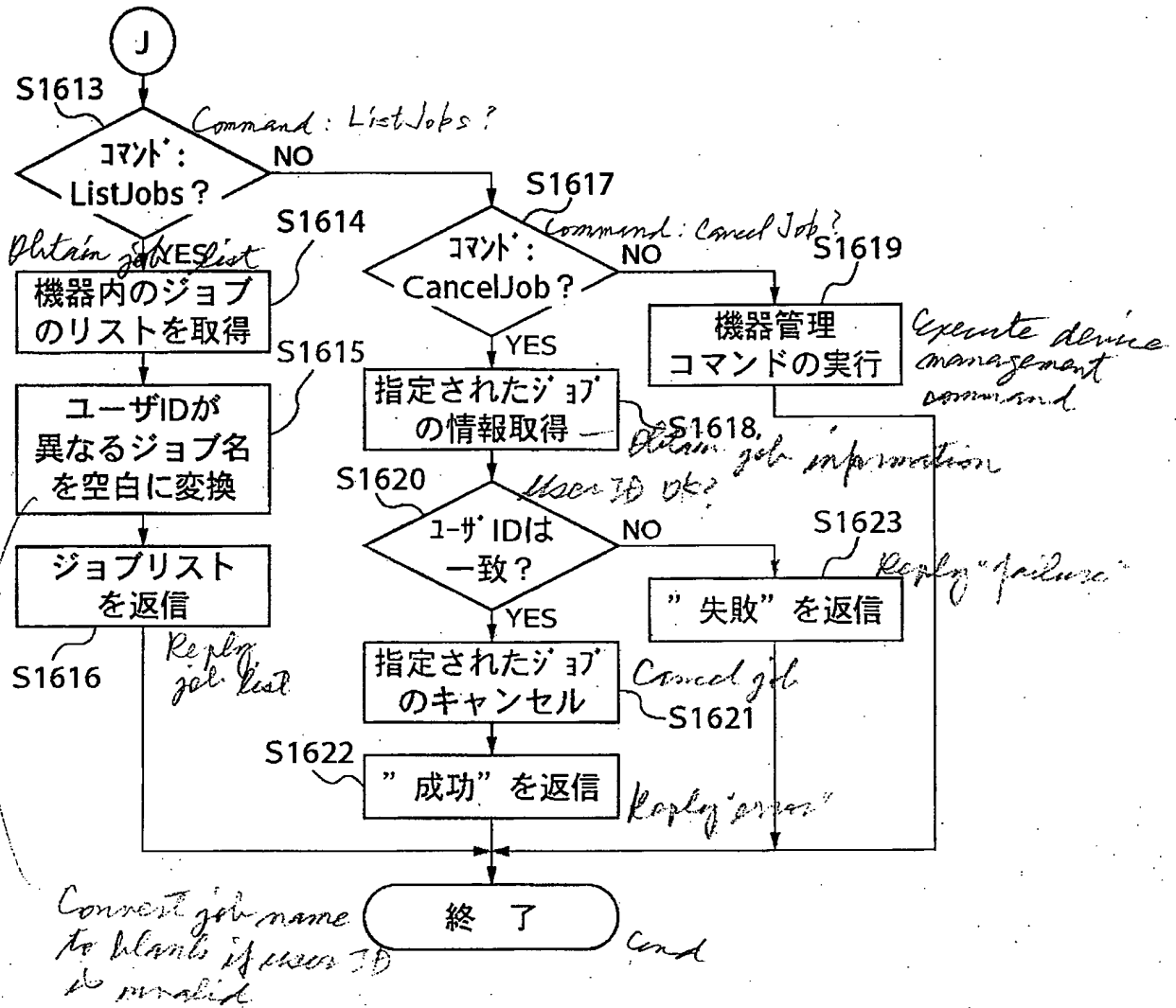
整理番号=4260030

【図30】 FIG. 30

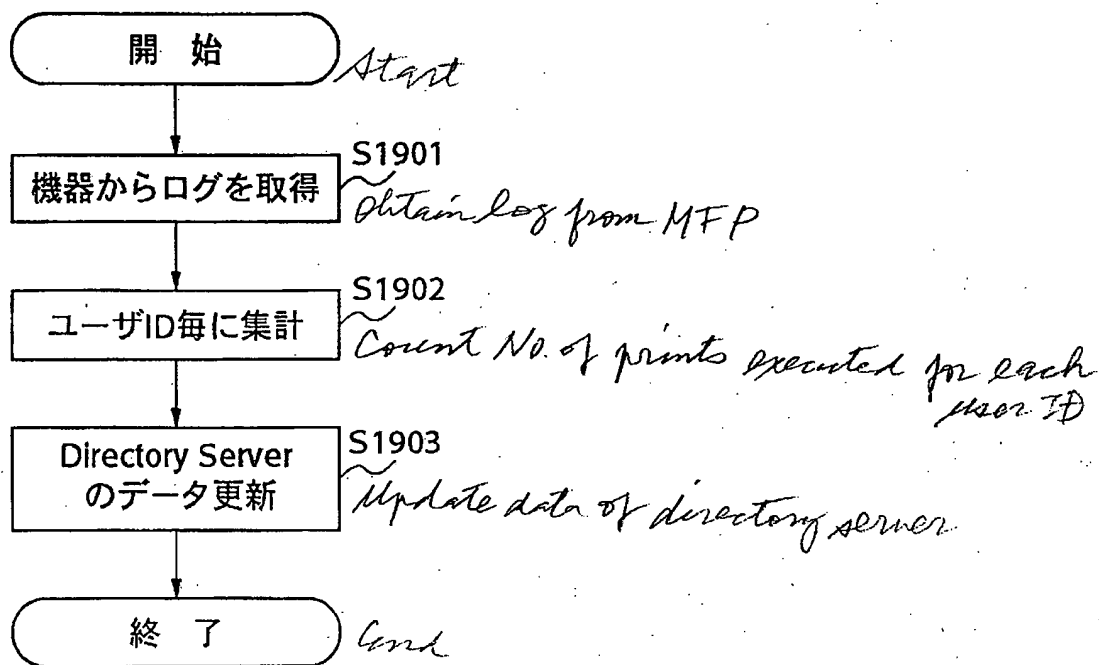


整理番号=4260030

【図31】 FIG. 31

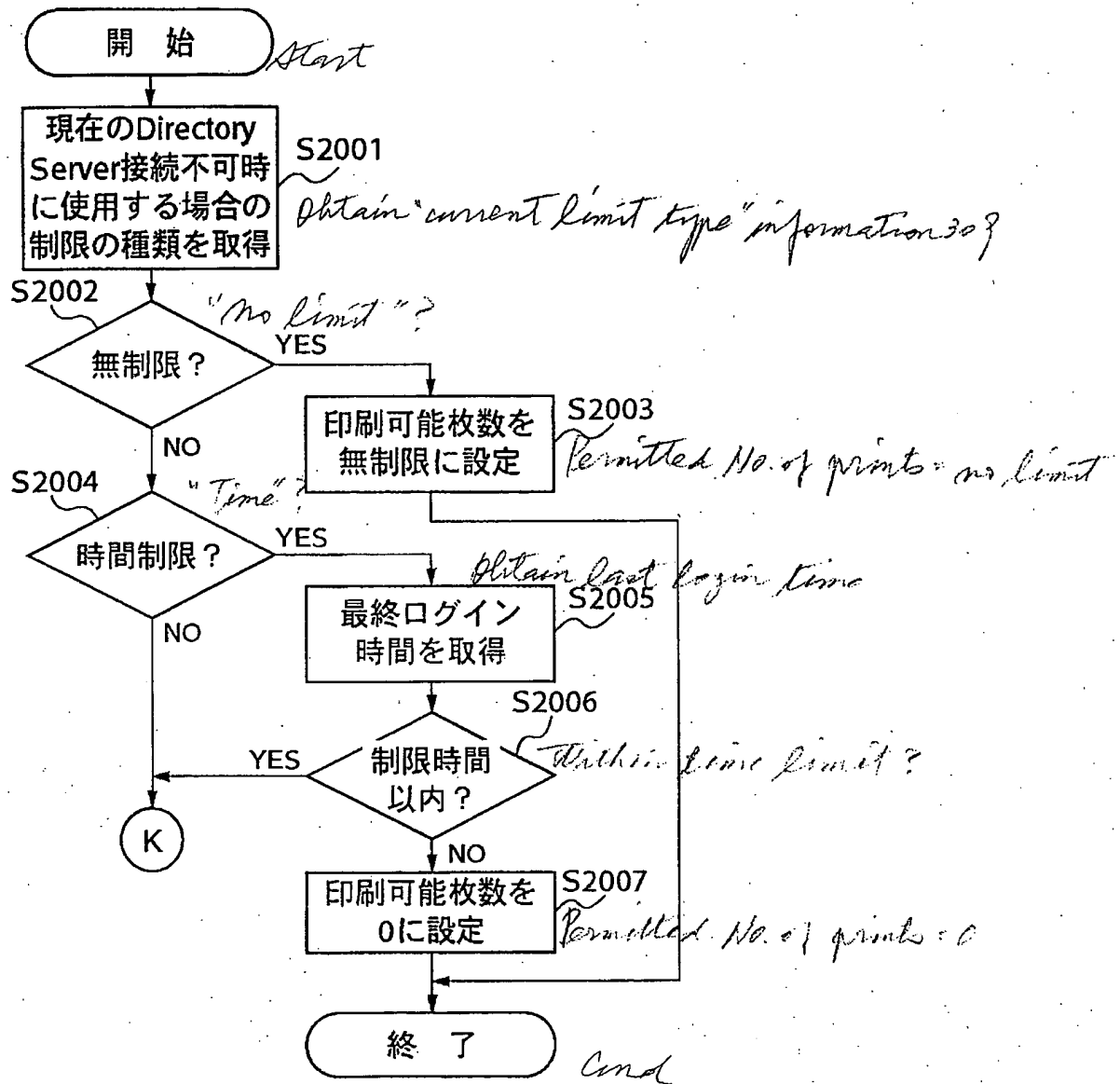


【図32】 FIG. 32

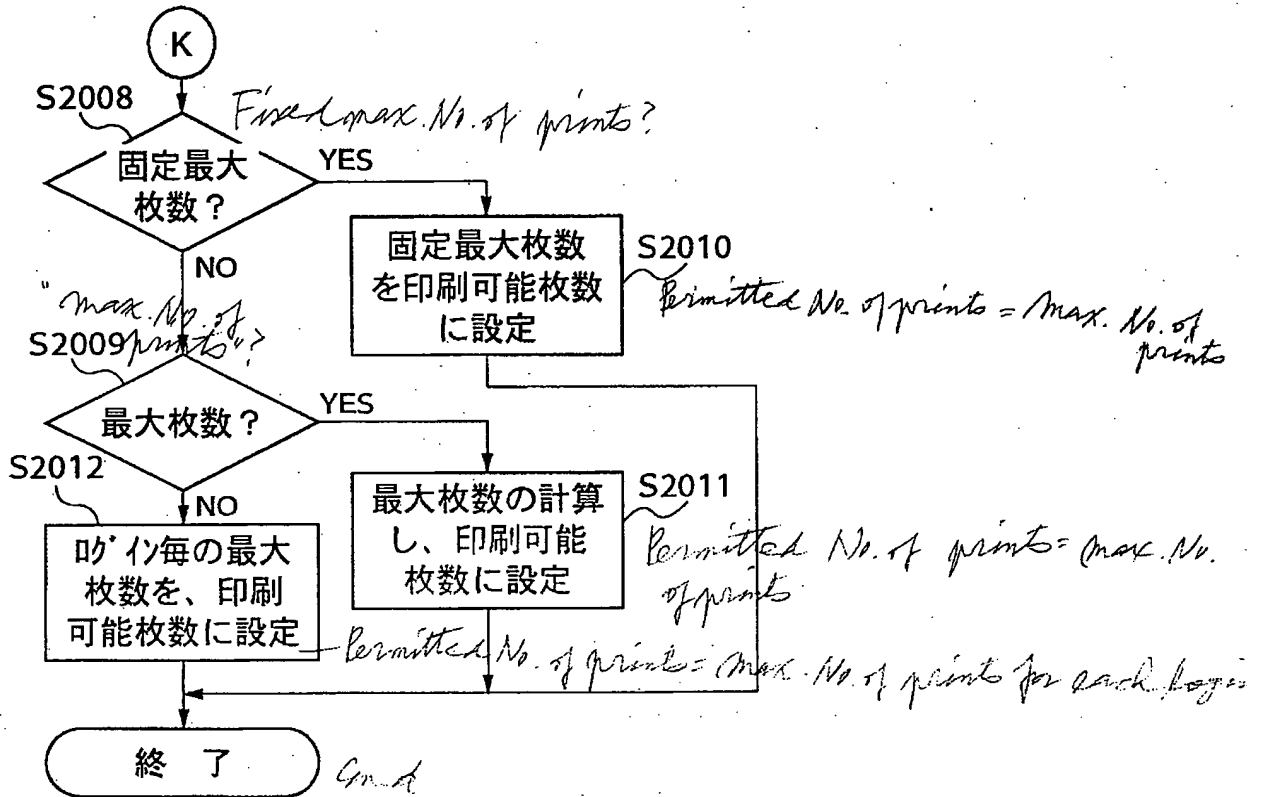


整理番号=4260030

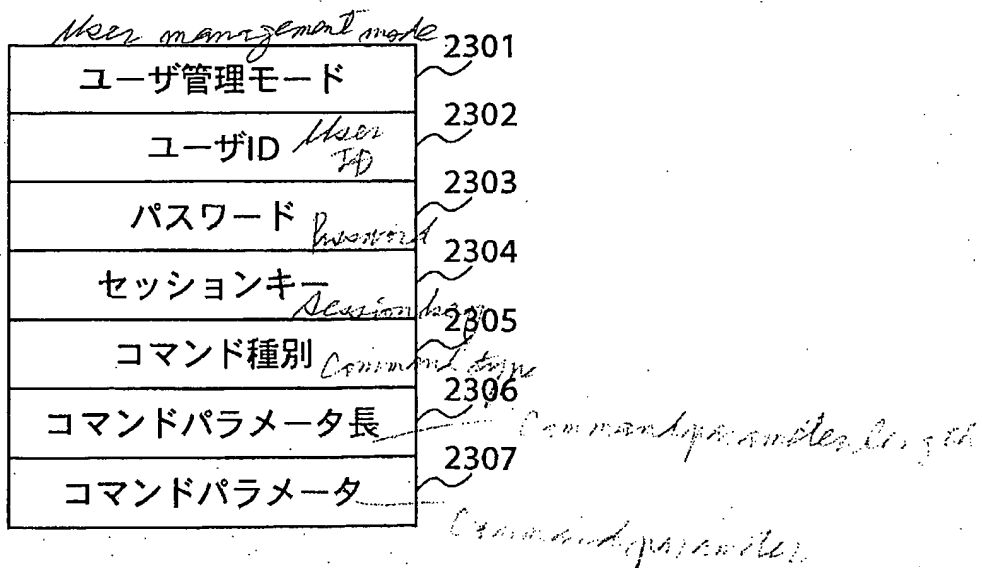
【図33】 FIG. 33



【図34】 FIG. 34



【図35】 FIG. 35



【図36】 FIG. 36

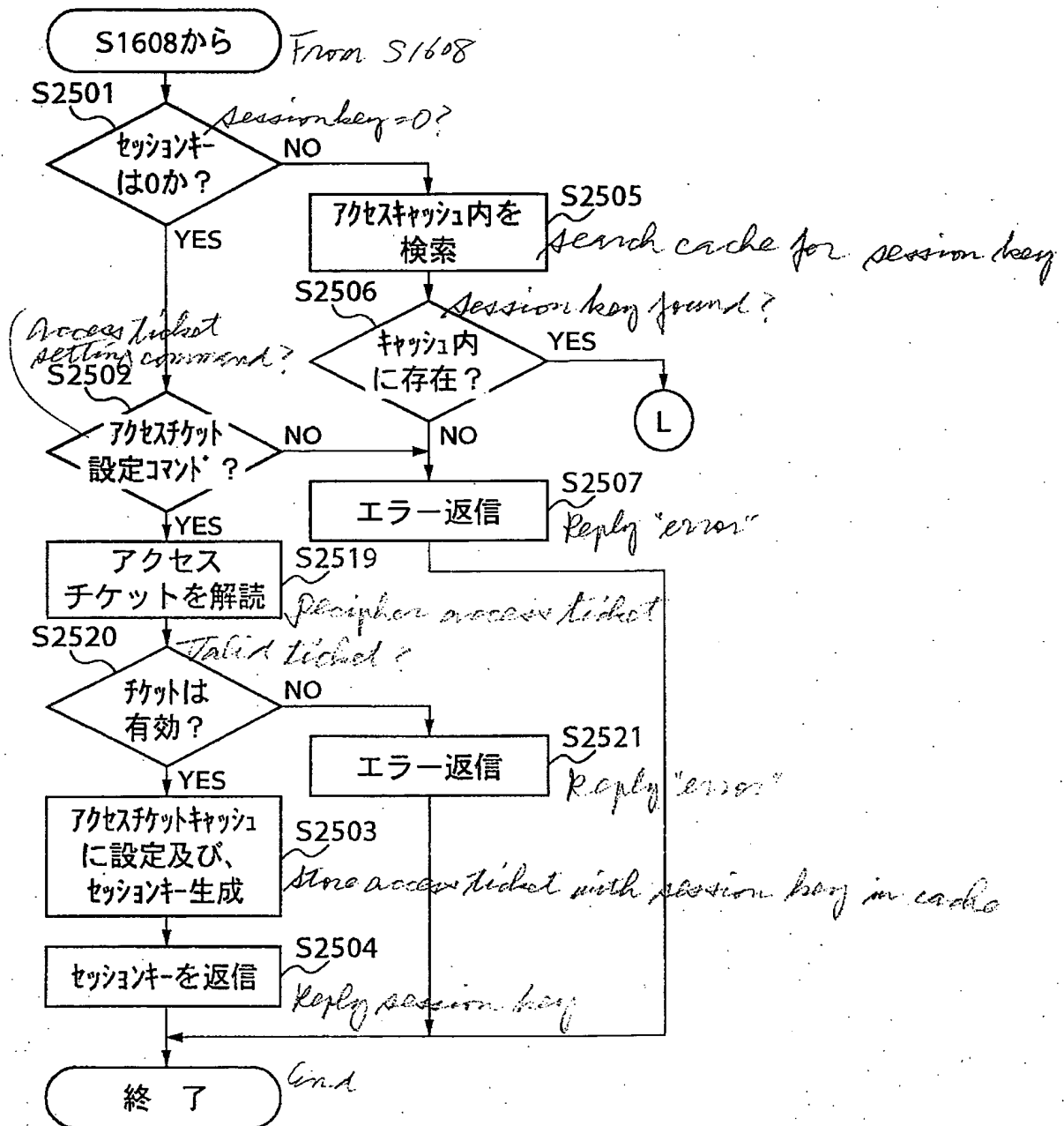
<div>2401</div> <div><i>session key</i></div> <div>セッションキー</div>	<div>2402</div> <div>解読されたアクセスチケット (ユーザIDなど)</div>
1234	2343,2344
4235	5313,5532

*Access ticket as
deciphered
(user ID etc.)*

整理番号=4260030

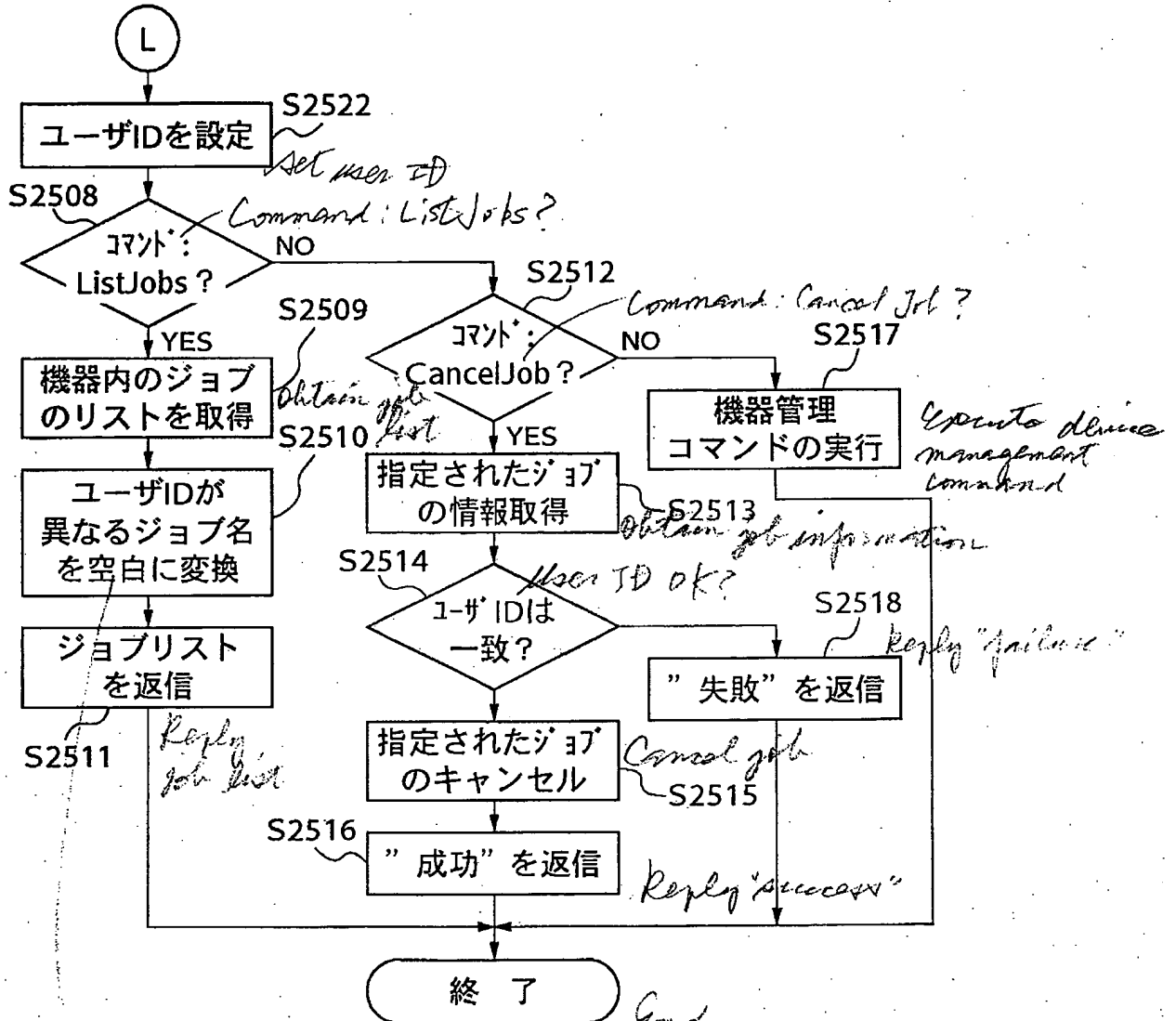
【図37】

Fig. 37



【図38】

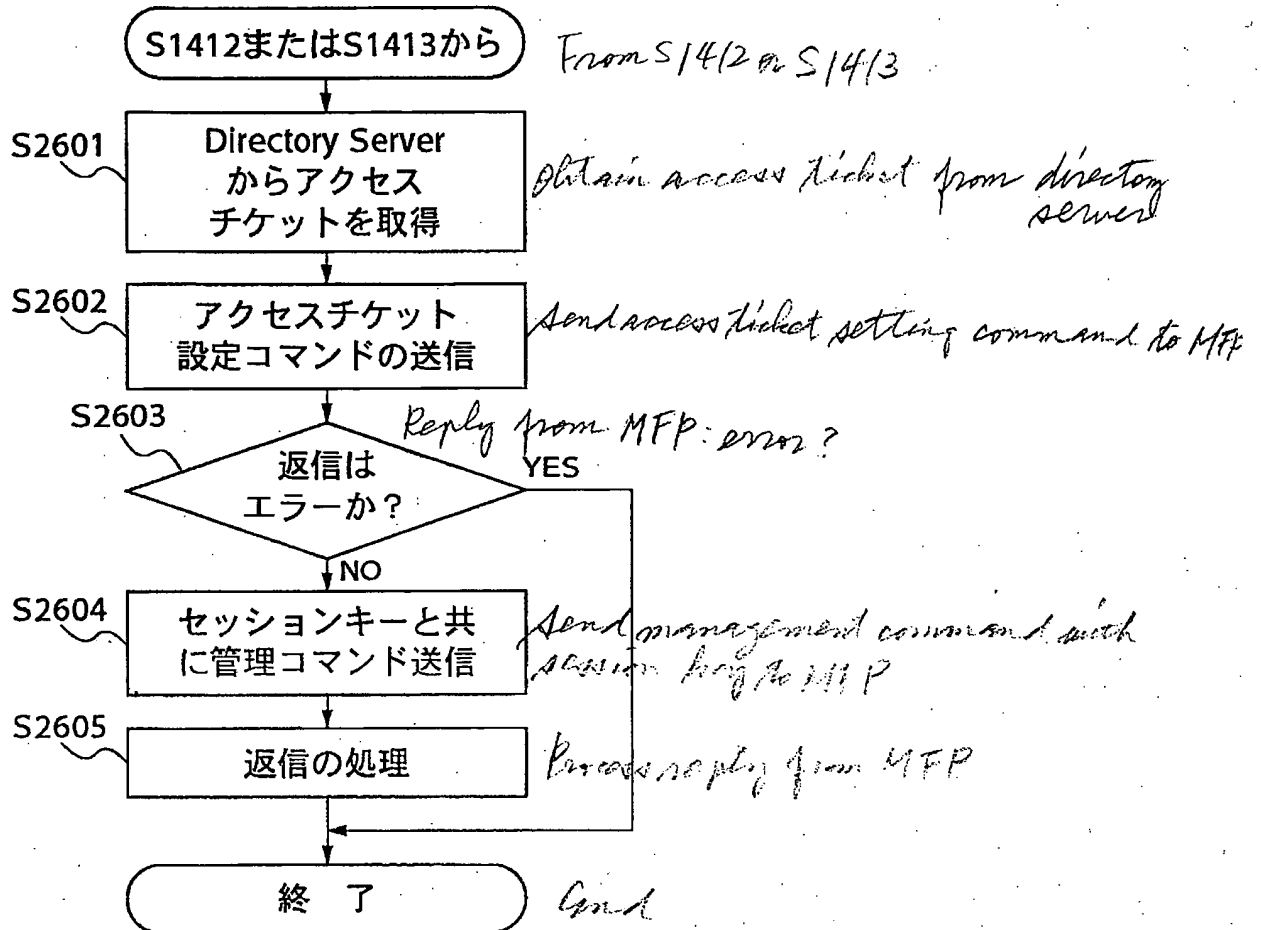
Flg 28



整理番号=4260030

【図39】

F19.39



[Name of the Document]

Abstract

[Abstract]

[Object]

An object of the present invention is to provide peripheral equipment which is capable of unified access control related to job management in a network environment.

[Means for Achieving the Object]

When managing a job inputted via a network or a console according to a job management command issued likewise via the network or the console, peripheral equipment managed by a directory server connected via the network decrypts an access ticket included in the job, decrypts the access ticket included in the job management command, and manages the job according to the decrypted contents of the access ticket included in the job and the access ticket included in the job management command.

[Elected Drawing]

FIGURE 31

Applicant's Information

Identification No. [000001007]

1. Date of Change: August 30, 1990

[Reason for Change] New Registration

Address: 30-2, 3-chome, Shimomaruko, Ohta-ku, Tokyo

Name: CANON KABUSHIKI KAISHA

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